FINAL
Santa Clara Valley Water District Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review

January 2015

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ACRONYMS AND ABBREVIATIONS

ACFE	Adobe Creek Watershed: Foothill Expressway
ACOE	U.S. Army Corps of Engineers
ACUR 5	Adobe Creek Watershed: Upper Reach 5
audit	Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review
BBCC	Reconstruction of Bollinger Bridge over Calabazas Creek
BCDC	Bay Conservation and Development Commission
BO	Biological Opinion
CCCO	Contra Costa County Department of Public Works
CCFP	Calabazas Creek Flood Project
CCRWQCB	Central Coast Regional Water Quality Control Board
CCWA	Contra Costa Water Agency
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CRLF	California red-legged frog
CWA	Clean Water Act
DGRP	Downtown Guadalupe River Project
District	Santa Clara Valley Water District
DMP	Dam Maintenance Project
EBMUD	East Bay Municipal Utility District
EMIMS	Ecological Monitoring Information Management Systems
FESA	Federal Endangered Species Act
FGC	California Fish and Game Code
GCP	Guadalupe Creek Project
GIS	geographic information system
HCP	Habitat Compensation Plan
JG	Jacques Gulch Restoration Project
LCC #2 & #3	Lower Coyote Creek Reaches 2 & 3

ACRONYMS & ABBREVIATIONS

LDOM	Lenihan Dam Outlet Modification
LGRP	Lower Guadalupe River Project
LLC #1	Lower Coyote Creek Reach 1
LSC	Lower Silver Creek Flood Protection and Creek Restoration Project
MBC	Matadero Barron Creek Long Term Remediation Project
mitigation	compensatory mitigation obligations
MMAD	Mitigation and Monitoring Activities Database
MMP	Mitigation and Monitoring Plan
MMWD	Marin Municipal Water District
NCRWQCB	North Coast Regional Water Quality Control Board
NMFS	National Marine Fisheries Service
Panorama	Panorama Environmental, Inc.
RWQCB	Regional Water Quality Control Board
SCWA	Sonoma County Water Agency
SFBRWQCB	San Francisco Bay Regional Water Quality Control Board
SFPUC	San Francisco Public Utilities Commission
SMP	Stream Maintenance Program
SMP1 (HE)	SMP1 habitat enhancement mitigation
SMP1 (LA)	SMP1 land acquisition mitigation for effects to stream and watershed protection mitigation (820 – 1,080 acres) and freshwater wetland mitigation (14 acres)
SMP1	Santa Clara Valley Water District's Stream Maintenance Program 1
SMP2	Santa Clara Valley Water District's Stream Maintenance Program 2
UGRP	Upper Guadalupe River Project
USFWS	U.S. Fish and Wildlife Service

ES EXECUTIVE SUMMARY

BACKGROUND

The Santa Clara Valley Water District (District) contracted Panorama Environmental, Inc. (Panorama), to perform an independent Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review (audit) to evaluate whether the District is meeting applicable legal and regulatory requirements related to its compensatory mitigation obligations (mitigation) and to benchmark the obligations against those of other public agencies. The audit focuses on the District's operations and maintenance activities and capital projects in the Watershed Management and Water Utility divisions, and includes all mitigation associated with the District's multi-year Stream Maintenance Program (SMP).

Another objective of the audit is to evaluate the consistency of the District's internal mitigation commitments and to compare the District's mitigation obligations with those of other comparable agencies to determine whether the District's obligations are commensurate with those of other agencies.

FINDINGS

The main findings from the audit are:

1. District is meeting or exceeding its mitigation obligations, with some obligations in process
2. Small increases in mitigation ratios result in millions of dollars in additional mitigation costs
3. SMP2 does not function as a program with a programmatic permit
4. Compensatory mitigation ratios are similar across District divisions
5. District mitigation for Watershed projects and Water Utility projects is similar to that of other agencies
6. District mitigation for the SMP is more complex and has higher compensation ratios than the Sonoma County Water Agency SMP
7. The District has unique mitigation measures
8. District mitigation monitoring timeframes are longer than other public agencies
9. Multiple District databases are not being used effectively or consistently

RECOMMENDATIONS

The audit findings were reviewed to identify methods of improving District compliance procedures. The recommendations were developed to standardize procedures across divisions, enhance communication among District staff, and facilitate effective negotiations with agencies. Each recommendation is tied directly to a finding. The key recommendations are described in Table ES-1.

Table ES-1: Findings and Recommendations

Findings	Recommendation
Finding 1: District is meeting or exceeding its mitigation obligations, with some obligations in process **Finding 2**: Small increases in mitigation ratios result in millions of dollars in additional mitigation costs **Finding 7**: The District has unique mitigation measures **Finding 8**: District mitigation monitoring timeframes are longer than other public agencies	*1. Improve the mitigation measure and permit negotiation process*
	Recommendation 1a: Revisit and implement previous recommendations made for the permit negotiation process • The District does not use the knowledge obtained from monitoring to leverage better deals when negotiating with regulatory agencies.
	Recommendation 1b: Use an outside California Environmental Quality Act (CEQA) attorney to review and negotiate mitigation measures, land management plans, and conservation easements to ensure the efficient, cost-effective, and timely completion of mitigation, land management plans, and conservation easements.
	Recommendation 1c: The District Environmental Planners should negotiate permits with the regulatory agencies, with a CEQA attorney.
	Recommendation 1d: Allow more time for permitting.
	Recommendation 1e: Improve continuity in environmental planner participation from design phase through construction.
	Recommendation 1f: Enhance on-site habitat; if not possible, fund habitat acquisition through a third-party.
Finding 2: Small increases in mitigation ratios result in millions of dollars in additional mitigation costs **Finding 8**: District mitigation monitoring timeframes are longer than other public agencies **Finding 9**: Multiple District databases are not used effectively or consistently	*2. Track impacts and mitigation implementation to avoid expending more than required on mitigation*
	Recommendation 2a: Revisit and implement previous recommendations regarding tracking of mitigation activities consistently and in one database. • There are flaws in the District's tracking of mitigation monitoring activities and there is a need for better data management structures and procedures, including consistent staff access to monitoring data.
	Recommendation 2b: Define actual impacts from previous projects and compare to mitigation implemented to determine whether excess mitigation is available for other projects.
	Recommendation 2c: Consolidate the mitigation tracking databases and include a GIS element.

Table ES-1 (*Continued*): Findings and Recommendations

Findings	Recommendation
Finding 3: SMP2 does not function as a program with a programmatic permit **Finding 6**: District mitigation for the SMP is more complex and has higher compensation ratios than the Sonoma County Water Agency SMP	*3. Improve District structure and procedures for permitting*
	Recommendation 3a: Revisit and implement previous recommendations regarding improving staff collaboration. • The District needs qualified staff whose primary assignment is to integrate the District's monitoring efforts into a unified, efficient, and effective program. • Improve communication between engineering Project Managers and staff scientists. Project Managers focus on obtaining regulatory approvals or settlements quickly so that projects, operations, and maintenance can proceed. Staff scientists focus on providing accurate and defensible scientific and technical analysis. Because of these differing priorities it is important that there is a process to facilitate communication and collaboration between Project Managers and staff scientists.
	Recommendation 3b: Specify procedures for CEQA planners to conduct mitigation monitoring or reporting following completion of the CEQA document.
	Recommendation 3c: Increase collaboration between environmental units (planning and mitigation units).
	Recommendation 3d: Hold in-house training for CEQA and regulatory requirements and for the District's mitigation and maintenance process.
	Recommendation 3e: Future SMPs should define a process similar to the SCWA SMP where interim agency authorizations are not required, in order to function more like a program.
	Recommendation 3f: Obtain concurrence from agencies related for mitigation measures that are complete or have met their success criteria.

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1 BACKGROUND: WHY DOES THE DISTRICT NEED COMPENSATORY MITIGATION?

1.1 DISTRICT OPERATIONS

The Santa Clara Valley Water District (District) manages an integrated water resources system that includes a supply of clean water, flood protection, and stewardship of streams for Santa Clara County's 1.8 million residents. The District manages 12 dams, ten surface water reservoirs, three water treatment plants, an advanced recycled water purification center, almost 400 acres of groundwater recharge ponds, and more than 275 miles of streams.

The District operates dams and pipelines and manages Santa Clara Valley watersheds for flood protection. The District's primary functions of water resource management and flood protection require frequent work in streams, wetlands, and other sensitive habitats.

1.2 LEGAL REQUIREMENTS

The California Environmental Quality Act (CEQA) requires agencies to consider the environmental effects of their decisions prior to approving or initiating any project, and prior to obtaining permits from regulatory agencies. Projects must be reviewed in compliance with CEQA. CEQA environmental review documents frequently specify compensatory mitigation for project effects to regulated habitats, such as streams, wetlands, and endangered species habitats. The District is legally obligated to implement the mitigation measures, including compensatory habitat mitigation, for effects to resources under jurisdiction of the resource agencies, such as the U.S. Army Corps of Engineers (ACOE), the U.S. Fish and Wildlife Service (USFWS), the California Department of Fish and Wildlife (CDFW), and Regional Water Quality Control Boards (RWQCBs). Compensatory mitigation typically requires the restoration of in-kind habitat that may have been affected by District activities, or the acquisition of potential in-kind habitat that can be restored or enhanced.

District work, which may include dredging or depositing fill in wetlands or other waters of the U.S., requires a permit and usually requires mitigation of impacts. Effects to endangered species or their habitats also require permits and compensatory mitigation. The water resources and habitats are regulated under the Clean Water Act (CWA), the Porter-Cologne Water Quality Control Act, the Federal Endangered Species Act (FESA), the California Endangered Species Act (CESA), and the California Fish and Game Code (FGC). Permits are required prior to any action that would discharge dredged or fill materials to waters or result in “take”[1] of a listed species. The District’s flood control and watershed projects require construction and maintenance work in wetlands, riparian areas, streams, and habitats that support state and federally listed species. Work in these areas typically requires permits from one or more of the following agencies:

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- California Department of Fish and Wildlife
- Central Coast Regional Water Quality Control Board
- San Francisco Bay Regional Water Quality Control Board
- Bay Conservation and Development Commission

The District has project permits and a programmatic permit to conduct activities within jurisdictional resources. Project permits are used for a defined set of impacts that are associated with a single project. Programmatic permits are used for ongoing activities (e.g., maintenance) where the location and impact are not well defined.

The District first entered into multi-year Stream Maintenance Program (SMP1) permits with ACOE, USFWS, NMFS, CDFW, CCRWQCB, SFBRWQCB, and BCDC in 2002. The SMP1 permits included habitat enhancement and land acquisition mitigation mechanisms. Habitat enhancement was used to compensate for impacts to wetlands, waters, and riparian areas, whereas land acquisition was used to compensate for impacts to California red-legged frog (CRLF) and wetlands. The District had not completed the land acquisition required under the permits at the end of the 10-year agreement for SMP1 (2012). The permitting agencies extended the schedule for District acquisition of compensatory mitigation lands to 2015. The agencies were less willing to enter into another 10-year agreement for the District’s Stream Maintenance Program (SMP2) when a portion of the mitigation for SMP1 was outstanding. Because of the challenges in completing the mitigation for SMP1 and negotiating permits for SMP2, the District requested an audit to gain a better understanding of current District mitigation obligations, the overall performance of the District’s mitigation program, and a comparison of the District’s program with other similar agency programs.

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[1] Take is defined under FESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Take is defined under CESA as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.”

1.3 PURPOSE OF THE AUDIT

The District contracted Panorama Environmental, Inc. (Panorama), to perform an independent Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review to evaluate whether the District is meeting applicable legal and regulatory requirements related to its compensatory mitigation obligations and to benchmark the obligations against those of other public agencies. This report examines:

1. Mitigation requirements for the District's Watershed and Water Utility operations, maintenance, and capital projects and programs;
2. The extent to which the District is meeting its mitigation obligations;
3. The District's mitigation obligations compared with those of comparable agencies; and
4. Best practices and areas for continued improvement and efficiency.

1.4 AUDIT METHODOLOGY

The audit was conducted between April 2014 and September 2014, in accordance with generally accepted government auditing standards. The audit standards require that the audit be planned and conducted to obtain sufficient, appropriate evidence to provide a reasonable basis for findings and conclusions based on audit objectives. The evidence obtained during the audit includes mitigation monitoring and reporting plans, permit conditions, and mitigation monitoring reports; these documents provide a reasonable basis for the findings and conclusions based on the audit objectives. Field verification was not conducted. Appendix A provides additional information on the objectives, scope, and methodology for the audit.

The audit methodology included several tasks to identify District and benchmark agency mitigation obligations, determine compliance, and understand the process for mitigation and monitoring compliance. The mitigation obligations were benchmarked against the obligations of the following agencies:

- Contra Costa County Department of Public Works (CCCO)
- Contra Costa Water Agency (CCWA)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- San Francisco Public Utilities Commission (SFPUC)
- Sonoma County Water Agency (SCWA)

Audit methodology is summarized in Table 1.4-1 and further described in Appendix A.

Table 1.4-1: Audit Methodology

Task	Description
Data collection and analysis for District projects	Obtain District reports and permits, including Mitigation Monitoring and Reporting Plans, Compensatory Mitigation Plans, agency permits, and compliance monitoring reports to identify the mitigation obligations and determine compliance
District staff interviews	Interview environmental planners, as well as mitigation, vegetation management, and SMP staff, to gather additional perspective on the District's mitigation program
Data collection, analysis, and interviews with benchmark agencies	Obtain comparable agency reports and permits, interview staff, compare mitigation obligations to District obligations, and interview benchmarking agency staff regarding mitigation and compliance
Reports: Audit Report and Benchmark Report	Document the methodology, results, findings, and recommendations for all tasks
Presentations	Present reports to Program Manager and incorporate comments

1.5 ORGANIZATION OF THE AUDIT REPORT

The Audit Report is organized into the following parts:

- Section 1 provides District background and the purpose and methodology of the Audit
- Section 2 summarizes the main findings
- Section 3 summarizes the conclusions
- Section 4 describes the recommendations for the District
- Section 5 lists the bibliography for the audit
- Appendix A provides a summary of the objectives, scope, and methodology
- Appendix B provides a summary of the findings from the compensatory mitigation audit
- Appendix C provides a summary of the findings from the benchmarking review
- Appendix D provides a detailed discussion of the audit recommendations
- Appendix E provides the Excel database files for the compensatory mitigation audit and the benchmarking review, with details on mitigation obligations
- Appendix F provides additional mitigation information for the District and benchmarking agencies
- Appendix G provides the questionnaire forms that were used for the District staff and benchmarking interviews

2 FINDINGS

The nine key findings resulting from the audit are described in detail below.

2.1 FINDING 1—DISTRICT IS MEETING OR EXCEEDING ITS MITIGATION OBLIGATIONS, WITH SOME OBLIGATIONS IN PROCESS

For the purposes of this audit the District's performance in meeting its mitigation obligations was classified into three categories:

- Mitigation compliant and complete
- Mitigation partially compliant and/or not meeting objectives
- New project obligations not complete

Mitigation that is compliant and complete refers to mitigation obligations that the District has fully completed. The District has completed the mitigation requirements for 12 projects, seven of which exceeded their mitigation obligations (see Section 2.1.1).

Mitigation that is partially compliant and/or not meeting objectives refers to the District's outstanding mitigation obligations that are on schedule to be completed as required by the permits and agency agreements. There are three projects that the District is in the process of completing and therefore are classified as partially compliant (see Section 2.1.2).

New project obligations not completed refers to projects that have been recently permitted and that have just begun to implement mitigation to compensate for project impacts. It is too early in the mitigation process to determine the District's compliance for these projects. There are six projects that have mitigation in the initial phases (see Section 2.1.3).

The District has complied with, or is in the process of complying with, all of its mitigation obligations for all of the 21 projects reviewed in the audit.

2.1.1 Mitigation Compliant and Complete

The District has successfully completed all mitigation required for 12 of the 21 projects reviewed in the audit. Figure 2.1-1 illustrates the acreage of required compensatory mitigation for each District project and the acreage of mitigation that has been successfully completed. The mitigation for Lower Coyote Creek Reach #2 and Reach #3 are combined because the acreage of mitigation completed was not differentiated between reaches in the agency sign-off letter that verified mitigation completion.

The 12 projects with successful completed mitigation are:

1. Lower Coyote Creek Reach #1
2. Lower Coyote Creek Reach #2
3. Lower Coyote Creek Reach #3
4. Lower Silver Creek Flood Protection and Creek Restoration Project
5. Guadalupe Creek Project
6. Matadero Barron Creek Long term Remediation Project
7. Jacques Gulch Restoration Project
8. Adobe Creek Watershed: Upper Reach 5
9. Adobe Creek Watershed: Foothill Expressway
10. Calabazas Creek Flood Project
11. Reconstruction of Bollinger Bridge over Calabazas Creek
12. Lenihan Dam Outlet Modification

For some projects, the District has exceeded the mitigation requirements. The District has exceeded requirements for the following seven projects:

1. Lower Coyote Creek Reach #2
2. Lower Coyote Creek Reach #3
3. Guadalupe Creek Project
4. Matadero Barron Creek Long-term Remediation Project
5. Jacques Gulch Restoration Project
6. Calabazas Creek Flood Project
7. Lenihan Dam Outlet Modification

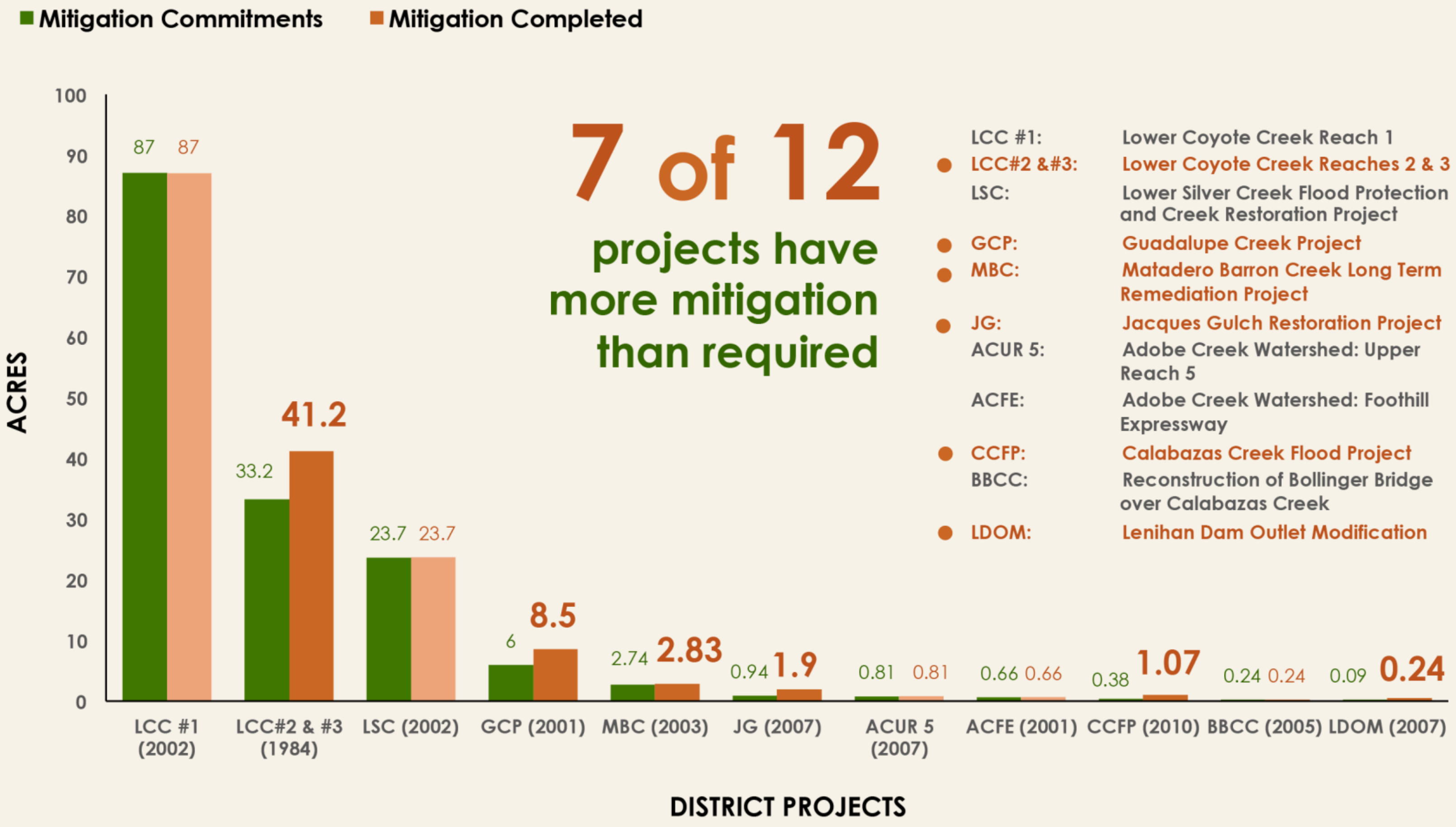
2.1.2 Mitigation Partially Compliant and/or Not Meeting Objectives

The District is in the process of completing mitigation on the following projects (see Figure 2.1-2):

1. SMP1—Pending completion of long-term management plans and easements
2. Lower Guadalupe River Project – In process
3. Downtown Guadalupe River Project – In process

The mitigation for the SMP1 land acquisition requirement under the Stream and Watershed Program is identified as a range of acreages because of the manner in which the mitigation ratio is applied. The District receives mitigation credit for the land that it acquires at a 10:1 ratio or at a 15:1 ratio (acquired acres: mitigation credit), based on the type of land that is acquired. Lands immediately adjacent to streams are credited at a 10:1 ratio and the lands farther from streams are credited at a 15:1 ratio. A combination of these two credit ratios can be applied to fulfill the mitigation requirement; thus, the District can acquire a range of acreages and still meet the mitigation requirement. The total land acquisition required ranges from 820 acres to 1,080 acres. The District could either mitigate 820 acres of land immediately adjacent to the streams, 1,080 acres of land farther from the stream, or a mix of land with acreage that falls within the 820 to 1,080-acre range. For further detail consult the SMP1 Manual.

Figure 2.1-1: District Project Mitigation Compliance

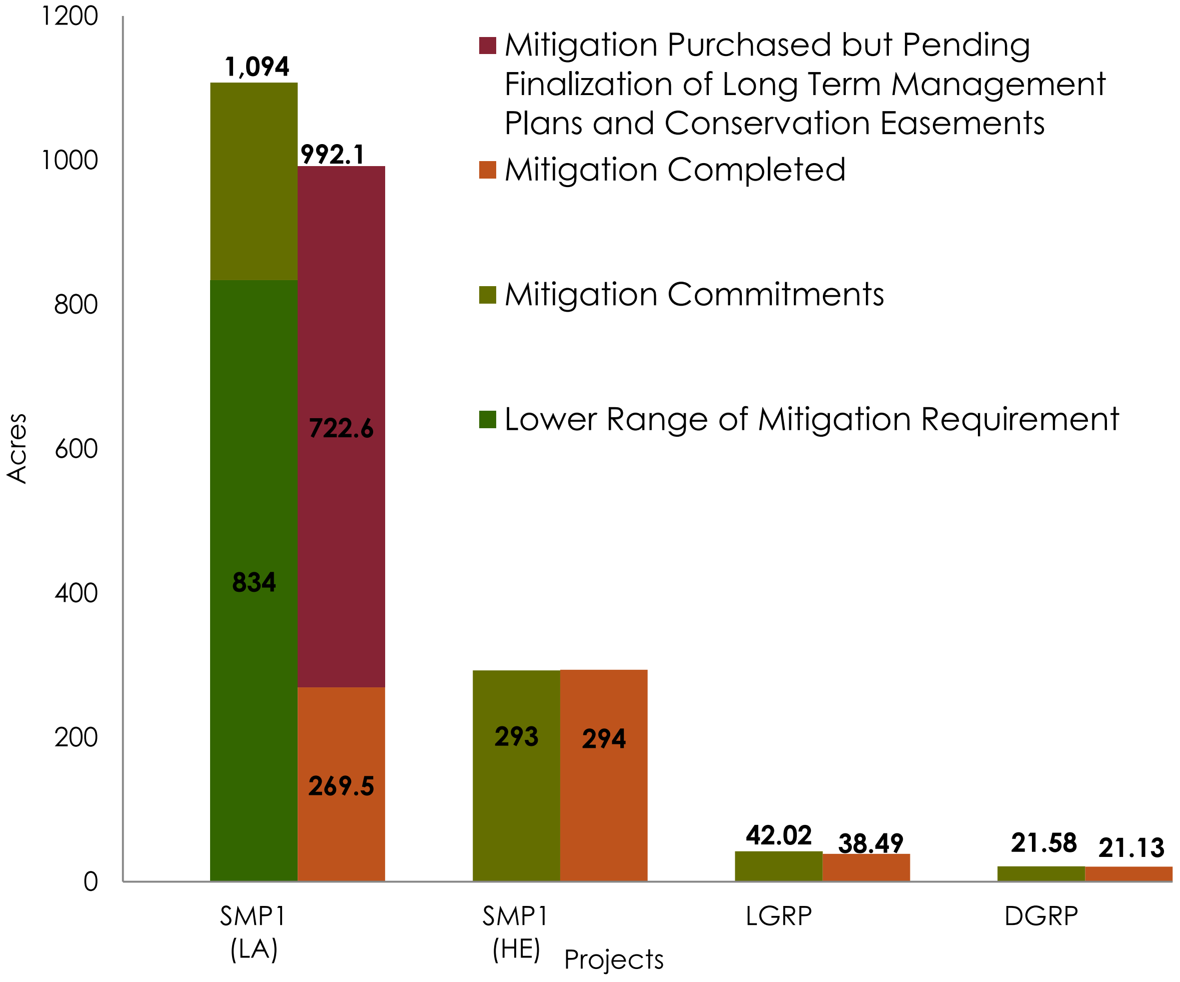


7 of 12 projects have more mitigation than required

	LCC #1:	Lower Coyote Creek Reach 1
●	LCC#2 &#3:	Lower Coyote Creek Reaches 2 & 3
	LSC:	Lower Silver Creek Flood Protection and Creek Restoration Project
●	GCP:	Guadalupe Creek Project
●	MBC:	Matadero Barron Creek Long Term Remediation Project
●	JG:	Jacques Gulch Restoration Project
	ACUR 5:	Adobe Creek Watershed: Upper Reach 5
	ACFE:	Adobe Creek Watershed: Foothill Expressway
●	CCFP:	Calabazas Creek Flood Project
	BBCC:	Reconstruction of Bollinger Bridge over Calabazas Creek
●	LDOM:	Lenihan Dam Outlet Modification

Note: Mitigation for Lower Coyote Creek Reach #2 and Reach #3 are combined because the acreage of mitigation completed was not differentiated between reaches in the agency sign-off letter that verified mitigation completion.

Figure 2.1-2: Mitigation Partially Compliant and/or Not Meeting Objectives



SMP1 (LA): SMP1 land acquisition mitigation for effects to stream and watershed protection mitigation (820 – 1,080 acres) and freshwater wetland mitigation (14 acres)
SMP1 (HE): SMP1 habitat enhancement mitigation
LGRP: Lower Guadalupe River Project
UGRP: Upper Guadalupe River Project
DGRP: Downtown Guadalupe River Project

The mitigation acreages (834 to 1,094 acres) on Figure 2.1-2 include 14 acres of freshwater wetland restoration mitigation. The 14 acres of freshwater wetland restoration are included in the mitigation lands obtained for the Stream and Watershed program mitigation.

SMP1—Partially Compliant and In Process

Compensatory mitigation obligations for SMP1 include habitat enhancement and land acquisition. Long-term management agreements and conservation easements must be developed and approved by the agencies for acquired lands.

Habitat Enhancement

The District has successfully completed all of the habitat enhancement mitigation under SMP1. The District enhanced 294 acres to meet the 293-acre compensatory mitigation commitment.

Land Acquisition

The District has acquired 992.1 acres of mitigation lands in fulfillment of the obligation to acquire 834 to 1,094 acres of habitat.

Management Agreements and Conservation Easements for Acquired Land

The land acquisition measures include a requirement to enter into long-term management plans and conservation easements for the acquired habitat. The management plan and easement are in place for the first 269.5 acres acquired (Figure 2.1-2). The land management plans and conservation easements for the remaining 722.6 acres were drafted for two of three mitigation sites in 2014; these plans and easements have not been approved by the agencies. The District is in the process of preparing the final conservation easement and land management plan.

The SMP1 required completion of the land acquisition mitigation by 2012. Because the District was unable to meet the initial deadline for acquiring land, the agencies granted the District an extension through 2015. The land acquisition mitigation will be complete when the management plan and easement are approved by the agencies and finalized. SMP unit staff is working to complete the agreements (and therefore the mitigation) by the new compliance deadline of 2015.

Lower Guadalupe River Project—Partially Compliant and in Process

Riparian

The District is required to establish 6.48 acres of riparian habitat to compensate for impacts from the Lower Guadalupe River Project. The monitoring report showed that in 2012, the District established 6.14 acres of riparian habitat as part of the mitigation effort. The reports do not indicate the reason for the reduced acreage; it may be due to a failure to meet success criteria or because riparian plants did not survive. The District has not established the entire area of mitigation that is required by the regulatory permits. The District still needs to create an additional 0.34 acres of riparian habitat to complete the mitigation.

The regulatory permits and the Mitigation and Monitoring Plan (MMP) do not have a deadline for when the riparian mitigation must be established. The MMP notes performance criteria (80 percent native cover) for 2045, Year 40. The District still needs to establish additional riparian habitat and still has time to complete these activities. The District is compliant with the mitigation timeframe.

Tidal Wetlands

The District is required to establish 35.54 acres of tidal wetlands for temporary and permanent impacts to wetland vegetation. The District has agreed to restore 35.54 acres of tidal wetland within the Island Ponds mitigation site. Restoration at the Island Ponds site commenced in 2006. The restoration approach is minimally engineered, uses passive design, and relies on natural sedimentation processes to restore the ponds to tidal marsh habitat. The performance criteria for the Lower Guadalupe River Project are:

- Restore 35.54 acres of vegetated tidal marsh located within a larger marsh area on the three island ponds
- Ensure that vegetation covers no less than 75 percent of the 35.54 acres
- Ensure that plant species composition consists of native tidal marsh species appropriate to the salinity regime
- Ensure that targets are achieved within 15 years following levee breach

In 2012 (monitoring year 7) the District established 32.25 acres of salt marsh vegetation for the Lower Guadalupe River Project. On average, there is 54 percent native vegetative cover at the mitigation site. In 7 years the District established 90 percent of the required habitat. The District must create 3.29 additional acres of tidal marsh vegetation and achieve vegetation cover of no less than 75 percent by 2020 in the next 8 years (by monitoring year 15). The District has 8 years to complete this mitigation so it is in compliance with the requirement.

Downtown Guadalupe River Project—Partially Compliant and In Process

The District is required to replace and maintain 0.58 acres (25,190 square feet) of river-run gravel suitable for spawning as mitigation for the Downtown Guadalupe River Project. The measure specifies adding gravel to spawning areas, placing boulders and weirs to retain gravel, and placing gravel upstream to supply the project area. The District implemented the measure and objectives were exceeded in several years at two of the three project areas. The District met the measurable objective for all three areas in water year 2003 (Table 2.1-1); however, the District has not consistently met the measurable objective for spawning gravels at the Guadalupe Creek mitigation site.

The mitigation program contemplated adaptive management strategies in the case that the measurable objectives were not met in the first 5 years. The District has taken remedial action to fulfill its mitigation requirements, based on the consensus of the Adaptive Management Team. In 2013 the District increased the amount of spawning gravels in Guadalupe Creek by 80 square feet and did not meet its requirements. The Adaptive Management Team is working with regulatory agencies to perform remedial actions in order to meet the mitigation requirements. The District is following procedures specified in the monitoring program but the measurable objectives are not consistently met. This obligation is considered partially compliant and in process because the District is still working with the Adaptive Management Team.

Table 2.1-1: Spawning Gravels at Each Project Area (square feet)

Water Year	Reach A	Guadalupe Creek	Reaches 1-3
Measurable Objective	**5,340**	**1,972**	**20,000**
2001	6,676	*	13,372
2002	9,782	0	29,521
2003	20,577	2,465	24,955
2004	26,413	347	27,803
2005	22,875	253	13,845
2006	14,694	908	20,072
2007	*	258	4,711
2008	*	756	33,470
2009	*	989	20,687
2010	*	961	*
2011	*	880	21,381
2012	4,842	826	*
2013	*	910	*

* Indicates that spawning gravel abundance was not measured this year; annual measurements were not required.
The shaded cells indicate objectives were achieved and exceeded.

2.1.3 New Project Obligations Not Complete

The District is in the initial phases of establishing mitigation for the following projects:

1. Upper Guadalupe River Project
2. Almaden Reservoir/Dam Maintenance Project
3. Anderson Dam/Dam Maintenance Project
4. Stevens Creek Reservoir/Dam Maintenance Project
5. Uvas Dam and Chesbro Dam/Dam Maintenance Project
6. Vasona Reservoir/Dam Maintenance Project

The compensatory mitigation obligations are specified in Table 2.1-2. It is too early in the mitigation process to determine the District's compliance with the mitigation requirements.

Table 2.1-2: Summary of Mitigation Obligations for Recent Projects

Project	Date of Permit	Type of Habitat Mitigation	Area of Mitigation (acres unless specified)	Area of Mitigation Established (acres unless specified)	Area of Mitigation Remaining (acres unless specified)
Upper Guadalupe River Project	December 2013	Freshwater wetland	1.47	0	1.47
		Riparian	20.89	0.70	20.19
		Shaded riverine aquatic cover	4,886 linear feet	0	4,886 linear feet
		River bank	1,720 linear feet	1,514 linear feet	206 linear feet
Almaden Reservoir Dam Maintenance Program (DMP)	June 2014	Riparian	0.15	Not verified	Not verified
Anderson Dam DMP	June 2014	Riparian	0.6	Not verified	Not verified
Stevens Creek Reservoir DMP	June 2013	Riparian	0.1	Not verified	Not verified
Uvas Dam and Chesbro Dam DMP	May 2013	Riparian	0.03	Not verified	Not verified
Vasona Reservoir DMP	June 2014	Wetland	0.12	Not verified	Not verified
Note: Panorama did not verify the area of mitigation established by the District for the Dam Maintenance Projects. Panorama lacked documents that showed District mitigation activities for the Dam Maintenance Projects.					

2.2 FINDING 2—SMALL INCREASES IN MITIGATION RATIOS RESULT IN MILLIONS OF DOLLARS IN ADDITIONAL MITIGATION COSTS

During the 10-year cycle for SMP1 the District conducted habitat enhancement mitigation at an average ratio of approximately 1.24:1. The SCWA SMP required the agency to conduct habitat enhancement mitigation at a ratio of 1.1:1. The SMP1 and the SCWA mitigation ratios differ by a factor of 0.14. This difference appears small, but has large financial impacts due to the scale of the District's SMP. SMP1 included impacts to 248 acres that required habitat enhancement mitigation. The additional 0.14 acres of mitigation for each acre impacted results in enhancement to an additional 34.72 acres ($248 \times 0.14 = 34.72$) relative to a 1.1:1 mitigation ratio. The mitigation of 34.72 additional acres costs the District between \$4.85 and \$13 million, depending on the habitat type (refer to Table 2.2-1). This small difference in the mitigation ratio (0.14) therefore adds up to substantial cost to the District because of the large scale of its mitigation program. This small difference between the SMP mitigation ratios illustrates the importance of effective negotiation for large programmatic permits.

Table 2.2-1: Example of Difference in Mitigation Costs with 0.14 Increase in Mitigation Ratio

Mitigation Ratio	Cost for 248 acres of SMP Habitat Enhancement[1]
1.1:1	$38,112,000 to $102,257,000
1.24:1	$42,890,000 to $115,271,000
Difference in Cost	**$4,778,000 to $13,014,000**

Note

[1] The cost to mitigate 1 acre of habitat was estimated based on the Santa Clara County Valley Habitat Plan fee schedule (ICF 2012). The range represents the mitigation costs for riparian habitat (lowest cost mitigation) and seasonal wetland mitigation (most expensive mitigation).

2.3 FINDING 3—SMP2 DOES NOT FUNCTION AS A PROGRAM WITH A PROGRAMMATIC PERMIT

The purpose of an SMP is to:

1. Establish programmatic guidance for the District's routine maintenance activities;
2. Facilitate avoidance and minimization of environmental impacts; and
3. Provide the organizational framework that oversees routine maintenance activities (Williams 2014).

Programmatic permits should allow the District to proceed with an assigned rule set; however, SMP2 allows the agencies to make ad hoc changes to the rule set after SMP2 permit authorization. The SMP2 does not function as a program with a programmatic permit because:

1. The mitigation ratios for land acquisition-based mitigation are considered "for planning purposes" and are subject to agency approval (see Table 10-5 in Williams 2014).
2. Agencies have the ability to change mitigation ratios. This occurred in 2014 when ACOE changed the mitigation ratio for a bank stabilization project that entailed hardscape placement. The SMP Program Manual required a 3:1 ratio but based on review, ACOE changed the ratio to 4:1.
3. Agencies do not have the same requirements for the same impacts. RWQCB will accept invasive plant management as mitigation but ACOE will only accept revegetation of riparian vegetation for impacts associated with installing rock in waters of the U.S.
4. Mitigation for the SMP2 is project-specific, meaning that project impacts are specifically matched with mitigation and agency approval is required for each project. The SMP2 process is different from the SMP1 process, in which

mitigation was systematically defined in the SMP Manual. The process of matching mitigation with specific impacts requires the District to seek agency approval for each project. This process is similar to the process of obtaining individual permits for each project.

2.4 FINDING 4—COMPENSATORY MITIGATION RATIOS ARE SIMILAR ACROSS DISTRICT DIVISIONS

2.4.1 Limited Mitigation for Water Utility Projects

The following six Water Utility projects were reviewed in this audit:

- Lenihan Dam Outlet Modification
- Almaden Reservoir/Dam Maintenance Project
- Anderson Dam/Dam Maintenance Project
- Stevens Creek Reservoir/Dam Maintenance Project
- Uvas Dam and Chesbro Dam/Dam Maintenance Project
- Vasona Reservoir/Dam Maintenance Project

These six projects have a combined 1.09 acres of mitigation obligations. The Watershed Management projects, by comparison, have 241.6 acres of combined mitigation. The SMP projects usually occur in habitats that require mitigation. The Water Utility projects do not necessarily occur in sensitive habitats; therefore, they typically have less compensatory mitigation.

2.4.2 SMP1 and Watershed Projects

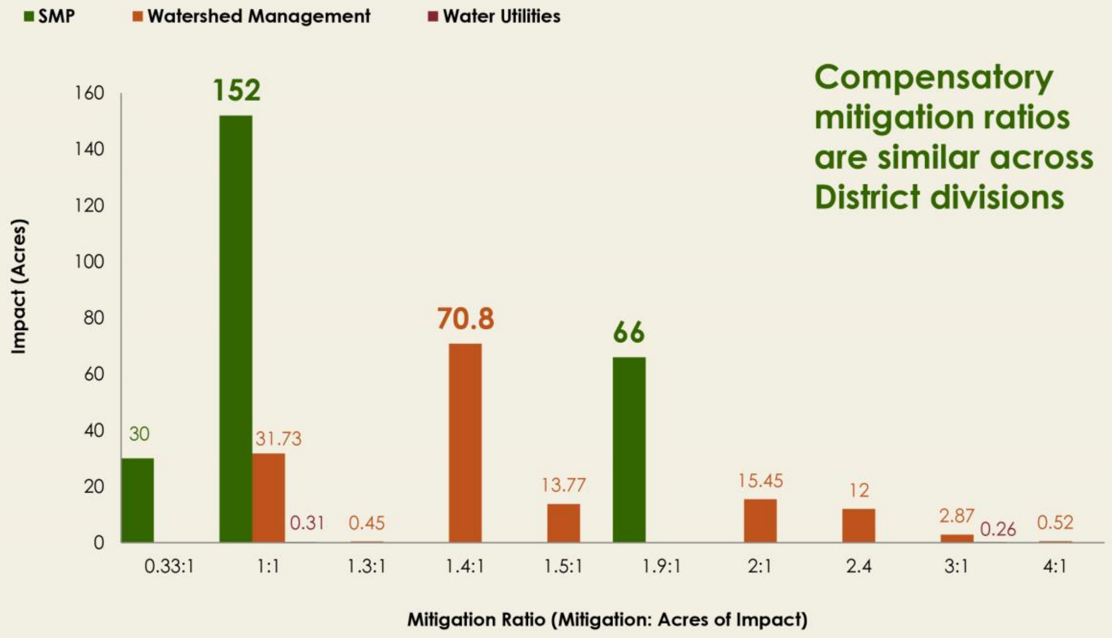
Habitat Improvement Mitigation

Mitigation ratios for the SMP1 and other Watershed Management projects were similar. SMP1 generally mitigates at the same or lower ratio than other Watershed Management projects because SMP1 involves temporary impacts to the stream corridor as a result of maintenance activities, whereas the other Watershed Management projects involve temporary and permanent impacts to habitat. The majority of SMP1 habitat mitigation was at a 1:1 ratio, whereas the most common mitigation ratios for the Watershed Management projects were 1.4:1 and 2:1. Figure 2.4-1 provides a summary of the mitigation ratios for the SMP1 and other Watershed Management projects. The SMP1 is mitigating for more acres of impact than all of the other Watershed Management projects combined.

Land Acquisition Mitigation

The greatest difference between the mitigation for SMP1 and the other Watershed Management projects is the use of land acquisition for mitigation. The land acquisition component of the SMP1 mitigation is the largest component of the District’s mitigation program based on the total acreage required. The District must acquire 820 to 1,080 acres of freshwater wetlands to mitigate for impacts to 108[2] acres of wetlands. The District received credit for the land acquired at a 10:1 or 15:1 ratio based on the distance of the acquired land from the stream. Lands immediately adjacent to streams are credited at a 10:1 ratio and lands farther from streams are credited at a 15:1 ratio. A combination of these two credit ratios can be applied to fulfill the mitigation requirement; thus, the District can acquire a range of acreages and still meet the mitigation requirement. No other District project mitigates at a ratio of 10:1 or 15:1 and the total compensatory mitigation acreage for all other projects is substantially less than that of the SMP1 due to the lower mitigation ratios for habitat enhancement.

Figure 2.4-1: Comparison of Habitat Improvement Mitigation Ratios for SMP1 and Watershed Projects



Compensatory mitigation ratios are similar across District divisions

Note: The numbers above the bars refer to the acres of impacted habitat that are being mitigated at the associated ratio.

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[2] The District was originally required to acquire 920-1,210 acres of mitigation lands based on the SMP1 Manual. The mitigation ratios of 10:1 and 15:1 were based on this initial requirement. The regulatory agencies (SFRWQCB, CDFW, and ACOE) decreased the required acreage to 820-1080 acres in their respective permits for the SMP1.

2.5 FINDING 5—DISTRICT MITIGATION FOR WATERSHED PROJECTS AND WATER UTILITY PROJECTS IS SIMILAR TO THAT OF OTHER AGENCIES

The District's mitigation ratios for projects not including the SMP1 or SMP2 are generally comparable to those of the benchmark agencies, which consisted of the following:

- Contra Costa County Department of Public Works (CCCO)
- Contra Costa County Water Agency (CCWA)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- San Francisco Public Utilities Commission (SFPUC)
- Sonoma County Water Agency (SCWA)

The District compensates for temporary impacts at a 1:1 ratio. Benchmark agencies are compensating for temporary impacts at ratios between 0.9:1 and 1.56:1. The District is compensating for permanent impacts at ratios between 1:1 and 4:1. Benchmark agencies are mitigating for permanent impacts at ratios between 0.6:1 and 4.3:1. District and benchmarking agency mitigation ratios for riparian habitat, wetlands, and trees are summarized in Table 2.5-1 and Figures 2.5-1 through 2.5-4. The District's mitigation ratios for temporary and permanent impacts are within the ranges that are used for benchmark agencies.

Table 2.5-1: Summary of Watershed and Water Utility Projects Benchmarking

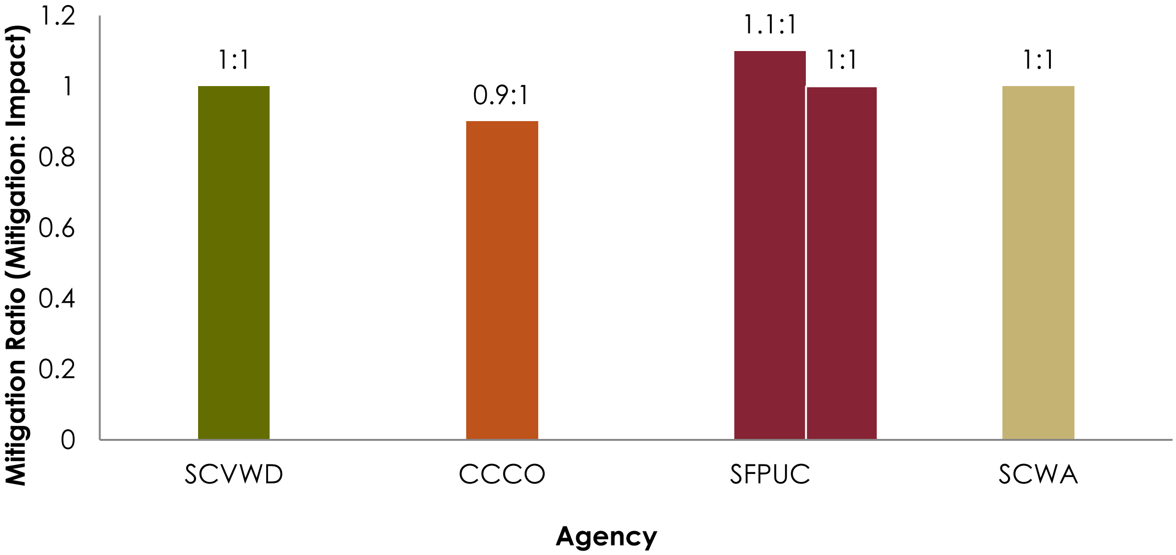
Type of Mitigation	District Mitigation Ratio	Benchmarking Agency Mitigation Ratio
Riparian Mitigation		
Mitigation for temporary impacts to riparian habitat	1:1	0.9:1 1:1 1.1:1
Mitigation for permanent impacts to riparian habitat	1.5:1 2:1 2.4:1 3:1 4:1	0.6:1 3:1 4.3:1
Wetland Mitigation		
Mitigation for temporary impacts to wetlands	1:1	1:1 1.1:1 1.56:1
Mitigation for permanent impacts to wetlands	1:1 1.4:1 2:1 3:1	3:1

Table 2.5-1: Summary of Watershed and Water Utility Projects Benchmarking

Type of Mitigation	District Mitigation Ratio	Benchmarking Agency Mitigation Ratio
Mitigation for Trees		
Mitigation for nonnative trees	1:1 2:1	1:1
Mitigation for native trees	3:1	3:1
Mitigation for oak trees	10:1	10:1
Land Acquisition-Based Mitigation		
Land Acquisition Mitigation	10:1 15:1	14:1 1.8:1

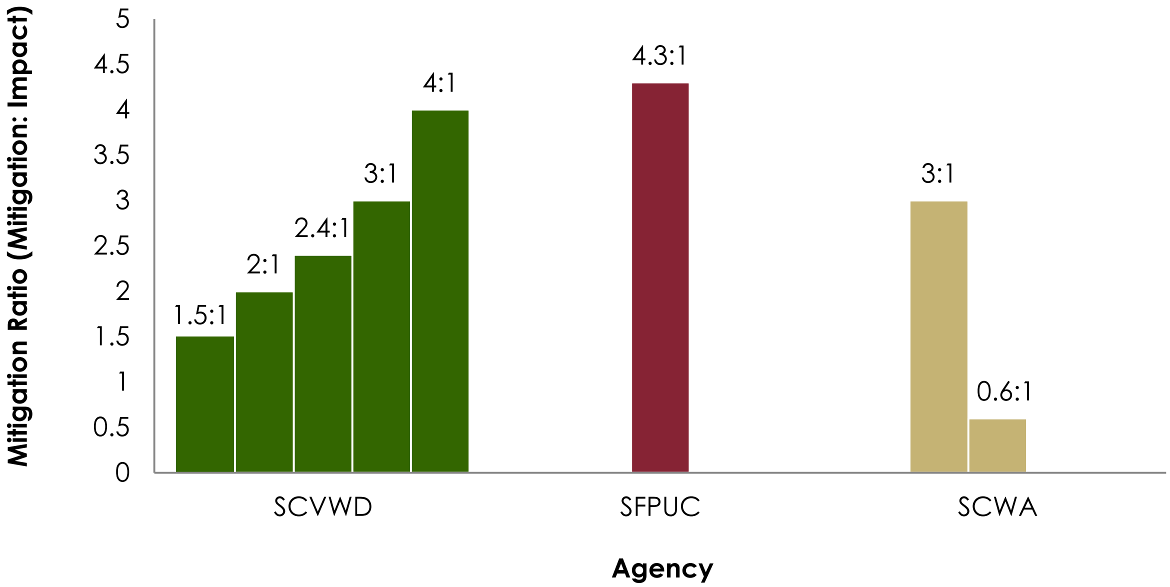
Note: Comparisons between District mitigation and benchmark agency mitigation were made according to similar mitigation requirements. Not every benchmark agency had the same type of mitigation and was therefore not included in every comparison. CCWA, EBMUD, and MMWD were not included in the riparian mitigation comparison; CCWA, EBMUD, and MMWD were not included in the wetland mitigation comparison; and SPFUC and EBMUD were not included in the tree mitigation comparison because no mitigation for those respective habitats was identified in the review of the benchmark projects.

Figure 2.5-1: Mitigation Ratios for Temporary Impacts to Riparian Habitat



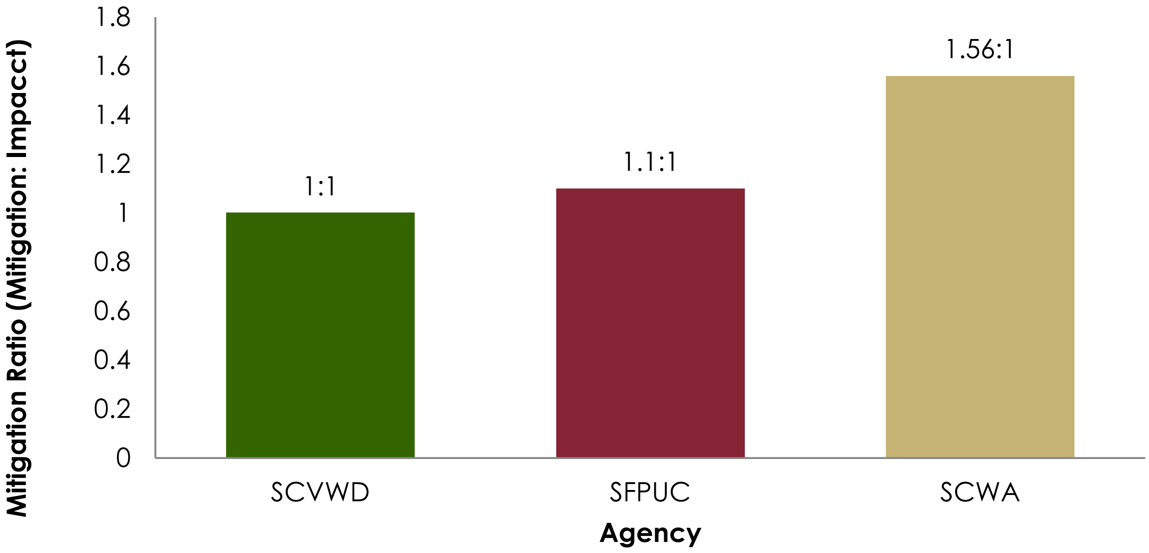
Note: Each bar indicates an agency project with temporary impacts to riparian habitat. Each bar may represent multiple projects and colors represent different benchmarking agencies

Figure 2.5-2: Mitigation Ratios for Permanent Impacts to Riparian Habitat



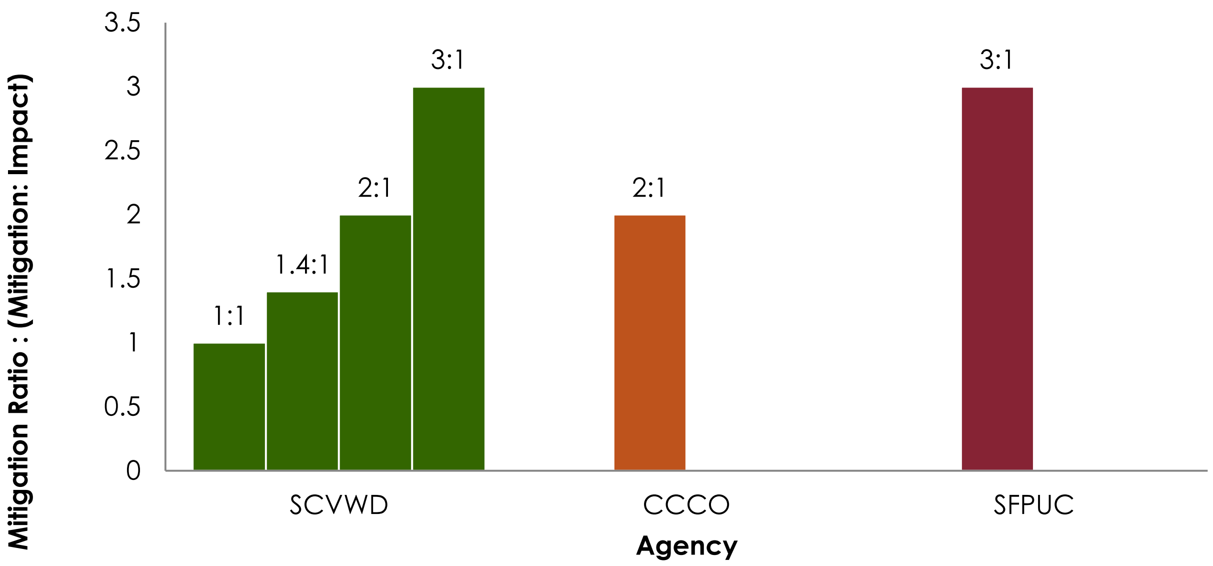
Note: Each bar indicates an agency project with temporary impacts to riparian habitat. Each bar may represent multiple projects and colors represent different benchmarking agencies

Figure 2.5-3: Mitigation Ratios for Temporary Impacts to Wetlands



Note: Each bar indicates an agency project with temporary impacts to riparian habitat. Each bar may represent multiple projects and colors represent different benchmarking agencies

Figure 2.5-4: Mitigation Ratios for Temporary Impacts to Wetlands



Note: Each bar indicates an agency project with temporary impacts to riparian habitat. Each bar may represent multiple projects and colors represent different benchmarking agencies

2.6 FINDING 6—DISTRICT MITIGATION FOR THE SMP IS MORE COMPLEX AND HAS HIGHER COMPENSATION RATIOS THAN THE SONOMA COUNTY WATER AGENCY SMP

2.6.1 SMP1 Benchmarking Against Sonoma County Water Agency SMP

The SCWA SMP is used to benchmark the District SMP because the activities and habitat types are comparable between the two SMPs. Both programs involve sediment removal, bank stabilization, and vegetation management in wetland and riparian habitats.

The District and the SCWA programs differ in the number of miles of streams covered under each SMP. The District SMP covers approximately 800 miles of streams and the SCWA SMP covers approximately 205 miles of streams. Both of the SMPs cover natural and modified channels. The District had more categories for compensatory mitigation and was required to acquire land. Land acquisition was difficult and included development of a management plan and conservation easement. Negotiation of the agreements has been ongoing for years. Land acquisition and management are outside of the mission of the District and may be better accomplished by third parties. SCWA contributes 10 percent of the costs of its bank stabilization activities to third-party non-profit agencies and Resource Conservation Districts.

The District and SCWA SMPs differ in the approaches to mitigation. Table 2.6-1 provides a summary of the differences between the District and the SCWA SMPs. Total District impacts are approximately 10 times greater than the SCWA impacts and total District SMP mitigation is about 30 times greater than total SCWA SMP mitigation. The difference in the total acreage of mitigation is primarily due to the use of off-site land acquisition at a very high mitigation ratio as a main component of the SMP1 mitigation. The District's mitigation ratio for habitat enhancement is 1.24:1 on average and the SCWA mitigation ratio for habitat enhancement is 1.1:1.

2.6.2 SMP2 Benchmarking Against Sonoma County Water Agency SMP

Mitigation ratios for the District SMP2 range from 1:1 to 4:1, and may be increased depending on the type of mitigation and at agency direction, whereas mitigation ratios for the SCWA SMP generally stay at 1.1:1, with the exception of impacts to trees and mitigation that do not meet success criteria.

The SMP2 is more complex than the SCWA SMP because it has more mitigation ratios and more categories of impacts that require mitigation. Figure 2.6-1 provides a summary of the mitigation ratios for impacts related to the SMP2 activities of vegetation management, sediment removal, and bank stabilization. Mitigation is determined by the following factors:

- The maintenance activity (green boxes)
- The mitigation type (orange boxes)
- The type of channel (beige boxes)
- The type of land acquisition-based mitigation (blue boxes)

In contrast, the SCWA SMP consistently uses a 1.1:1 ratio in all scenarios. Use of a standard ratio in the SCWA SMP provides a simpler mechanism to implement mitigation and to track and account for mitigation. A simplified program reduces staff time spent negotiating and reporting to agencies, defining the mitigation needed, and accounting for the mitigation completed.

2.7 FINDING 7—THE DISTRICT HAS UNIQUE MITIGATION MEASURES

Under the SMP2 the District is required to provide compensatory mitigation for mowing and routine pruning activities. These unique mitigation requirements were not included in any other benchmarking agency permit conditions, including one benchmarking project that included mowing and pruning activities (in habitat with a similar potential for sensitive species). The typical mitigation for these types of activities usually includes preconstruction surveys, avoiding nesting or reproductive seasons, and biological monitoring.

Mitigation for routine pruning under SMP2 is calculated by multiplying the area of vegetation removed (square feet) by the percentage of the tree stand that is pruned.

Figure 2.6-1: Summary of Mitigation Ratios for SMP2

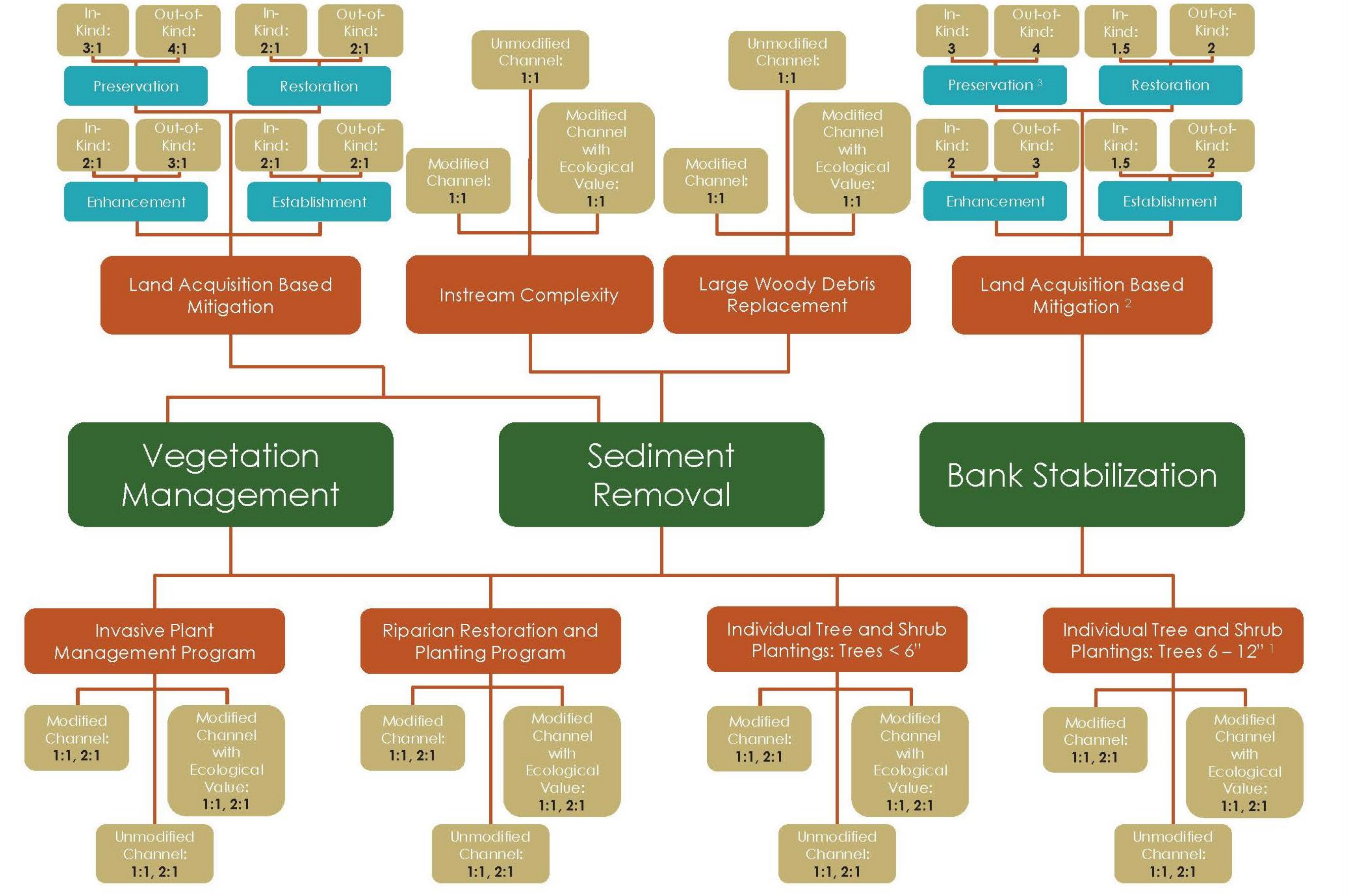

In-Kind: 3:1
Out-of-Kind: 4:1
In-Kind: 2:1
Out-of-Kind: 2:1
Preservation
Restoration
In-Kind: 2:1
Out-of-Kind: 3:1
In-Kind: 2:1
Out-of-Kind: 2:1
Enhancement
Establishment
Land Acquisition Based Mitigation
Unmodified Channel: 1:1
Modified Channel: 1:1
Modified Channel with Ecological Value: 1:1
Instream Complexity
Unmodified Channel: 1:1
Modified Channel: 1:1
Modified Channel with Ecological Value: 1:1
Large Woody Debris Replacement
In-Kind: 3
Out-of-Kind: 4
In-Kind: 1.5
Out-of-Kind: 2
Preservation 3
Restoration
In-Kind: 2
Out-of-Kind: 3
In-Kind: 1.5
Out-of-Kind: 2
Enhancement
Establishment
Land Acquisition Based Mitigation 2
Vegetation Management
Sediment Removal
Bank Stabilization
Invasive Plant Management Program
Modified Channel: 1:1, 2:1
Modified Channel with Ecological Value: 1:1, 2:1
Unmodified Channel: 1:1, 2:1
Riparian Restoration and Planting Program
Modified Channel: 1:1, 2:1
Modified Channel with Ecological Value: 1:1, 2:1
Unmodified Channel: 1:1, 2:1
Individual Tree and Shrub Plantings: Trees < 6"
Modified Channel: 1:1, 2:1
Modified Channel with Ecological Value: 1:1, 2:1
Unmodified Channel: 1:1, 2:1
Individual Tree and Shrub Plantings: Trees 6 – 12" 1
Modified Channel: 1:1, 2:1
Modified Channel with Ecological Value: 1:1, 2:1
Unmodified Channel: 1:1, 2:1

Table 2.6-1: Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Project Comparisons				
Miles of streams	800 miles	800 miles	205 miles	SMP has 4 times more miles of streams
Number of years the SMP has been in effect	10	1	5	SMP1 has been in effect for 5 more years
SMP activities	Sediment removal, bank stabilization, vegetation management	Sediment removal, bank stabilization, vegetation management	Sediment removal, bank stabilization, vegetation management	Same activities
Acres of impacts	248 acres (habitat improvement) 108 acres (land-acquisition)	Not Applicable[1]	32.83 acres (habitat improvement)	SMP1 has 10 times more impacts
Acres of habitat restoration mitigation	307	Not Applicable[1]	37.05 acres	SMP1 has 8 times more acres of mitigation required
Acres of land acquisition	820 – 1,080	Not Applicable[1]	Not Applicable[2]	SCWA SMP allows for paying a fee to a third-party for land acquisition and management
Mitigation Ratios				
Invasive Plant Management	0.33:1[3] 1.9:1	1:1[4] 2:1	1.1:1	SMP1 and SMP2 have more and larger ratios
Riparian Restoration	Not Applicable	1.1:1[5] 1.3:1 1.5:1 2:1	1.1:1	SMP2 has more and larger ratios
Trees and Shrubs (Vegetation)	1:1[6] 3:1	1:1[7] 1.1:1 1.3:1 1.5:1 2:1 3:1	1.5:1[8] 2:1	SMP2 has more and larger ratios
In-stream Complexity	Not Applicable	1:1	1.1:1	SCWA SMP has a larger mitigation ratio than SMP2

Table 2.6-1 (*Continued*): Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Land Acquisition-Based Mitigation	10:1[9] 15:1	1:1[10] 2:1 3:1 4:1	Not Applicable	SMP2 has more ratios; SCWA does not have this requirement
Large Woody Debris	Not Tracked	1:1	Not Applicable	SCWA does not have this activity or mitigation
Bank Planting	1:1[11] 3:1	1:1[12] 1.3:1 1.5:1 2:1 2.5:1 3:1	1.1:1	SMP2 has more ratios than SMP1 and SCWA SMP
Minor Work Activities	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Nontidal Wetland: Freshwater Wetland Creation/Restoration component	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Tidal Wetland	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Special-status Species Mitigation Ratios				
CRLF	1:1	3:1	1.1:1	SMP2 has larger ratios than SMP1 and SCWA SMP
California tiger salamander (CTS)	Covered with the Stream and Watershed Protection mitigation	3:1	2:1[13] 1:1 0.2:1	SMP2 has larger mitigation ratios than SCWA SMP; SCWA SMP has smaller ratios depending on distance from CTS habitat
Least Bell's vireo	Covered with the Stream and Watershed Protection mitigation	3:1	Not Applicable	SCWA SMP does not have this mitigation requirement
Salt marsh harvest mouse	3:1[14]	3:1	Not Applicable	SCWA SMP does not have this mitigation requirement

Table 2.6-1 (*Continued*): Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Clapper rail	3:1[14]	3:1	Not Applicable	SMP1 and SMP2 impacts only
Sonoma sunshine	Not Applicable	Not Applicable	3:1	Unique SCWA impact
Burke's goldfields	Not Applicable	Not Applicable	3:1	Unique SCWA impact
Sebastopol meadowfoam	Not Applicable	Not Applicable	2:1	Unique SCWA impact

Notes:

[1] This is not applicable because the District has just begun to mitigate for impacts.

[2] SCWA does not have land acquisition mitigation. Instead, SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools, and/or Resource Conservation Districts. SCWA contributes 10 percent of the annual cost of implementing SMP sediment removal and bank stabilization projects to fund projects that provide water quality, habitat, and ecosystem benefits.

[3] The 0.33:1 mitigation ratio applies to Smooth Cordgrass Control. The 1.9:1 ratio applies to Giant Reed Control.

[4] Ratio of 1:1 applies to Tier 1 species (invasive plant control requires 2 years or less time to achieve). Ratio of 2:1 applies to Tier 2 species (invasive plant control requires more than 2 years to achieve).

[5] Mitigation ratios depend on the maintenance activity and the type of channel where the maintenance activity was conducted (modified channel, modified channel with ecological value, and unmodified channel). Refer to Table F-1 in Appendix F.

[6] The 1:1 ratio applies to nonnative vegetation species and the 3:1 ratio applies to native vegetation species.

[7] Mitigation ratios depend on the size of the tree or shrub that was removed and the type of channel where the maintenance activity took place. Refer to Table F-1 in Appendix F.

[8] The 2:1 ratio applies to native trees and the 1.5:1 ratio applies to nonnative trees.

[9] This ratio applies to the freshwater wetland creation and restoration. The District receives credit for the lands they obtain at a 10:1 ratio or 15:1 ratio. The 10:1 ratio applies to lands adjacent to stream resources up to 50 feet from the centerline of first-order streams and 150 feet from the centerline of second-order and greater streams. The 15:1 ratio applies to lands from 150 feet up to 500 feet from the centerline of second-order and greater streams.

[10] The mitigation ratio depends on the function of the mitigation and whether it is in-kind or out-of-kind. Refer to Table F-1 in Appendix F.

[11] The 1:1 ratio applies to temporary impacts and the 3:1 ratio applies to permanent impacts.

[12] The mitigation ratios depend on the construction activity and the channel type (modified, modified with ecological value, or unmodified). Higher mitigation is a result of construction treatments where the rock area is left unplanted. The additional mitigation is required to compensate for the loss of channel functions due to the placement of non-vegetated rock.

[13] The 2:1 ratio applies to habitat affected 500 feet from known CTS occurrence, the 1:1 ratio applies to habitat affected 2,200 feet from known CTS occurrence, and the 0.2:1 ratio applies to habitat affected greater than 2,200 feet and less than 1.3 miles from known CTS occurrence.

[14] Eleven (11) acres of clapper rail and salt marsh harvest mouse habitat were estimated to be impacted by the SMP1. Thirty (30) acres of tidal wetlands were restored for impacts to tidal wetlands. The mitigation was applied to both effects.

Additionally, under the SMP2 the District is required to mitigate for the mowing of sensitive habitats such as wetlands or woody riparian vegetation, special–status plant species, and habitat for special-status wildlife species, including the least bell's vireo, California tiger salamander, and California red-legged frog.

The District identifies BMPs within the SMP2 to avoid the take of special-status species during mowing. These BMPs assure that direct impacts to special-status species are less than significant, and are similar to measures other agencies employ.

2.8 FINDING 8—DISTRICT MITIGATION MONITORING TIMEFRAMES ARE LONGER THAN OTHER PUBLIC AGENCIES

The District has far longer mitigation monitoring timeframes than other agencies (Figure 2.8-1). The District has the unique challenge of monitoring the following seven projects for a timespan of 100 years:

1. Lower Guadalupe Creek Project
2. Upper Guadalupe Creek Project
3. Downtown Guadalupe Creek Project
4. Guadalupe Creek Project
5. Lower Coyote Creek Project Reach #1
6. Lower Coyote Creek Project Reach #2
7. Lower Coyote Creek Project Reach #3

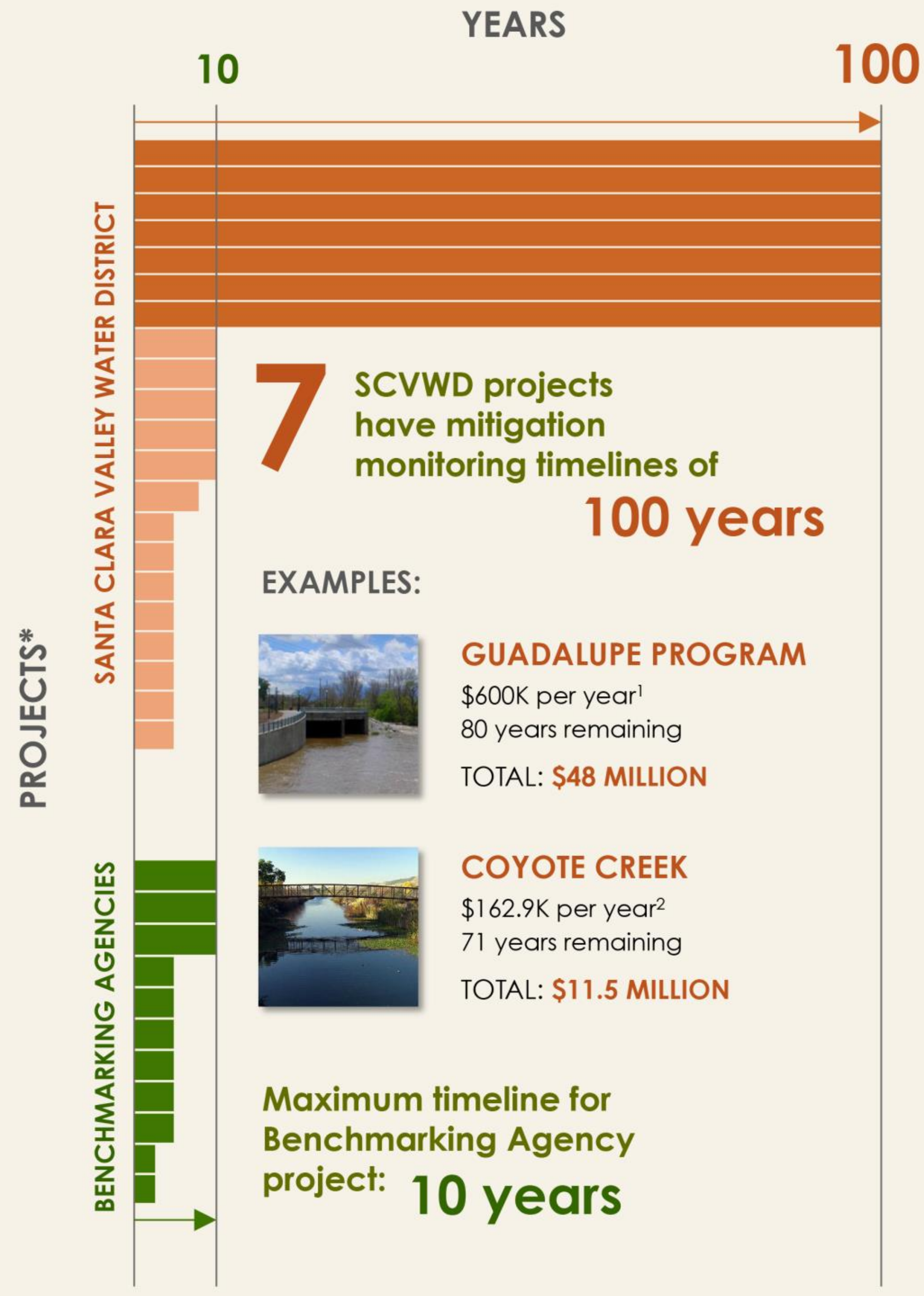
The District is monitoring 212.16 acres of mitigation lands for a period of 100 years. The 100-year monitoring timeframe applies to 13 percent of the all compensation acres identified in the audit. Six of the eleven benchmarking projects had a monitoring timeframe of 5 years and three of the eleven benchmarking projects had a monitoring timeframe of 10 years.

It is estimated that the District will spend approximately $59.5 million on monitoring projects over 100 years. Figure 2.8-1 illustrates the costs associated with monitoring the mitigation sites for projects with a 100-year monitoring timeframe.

2.9 FINDING 9—MULTIPLE DISTRICT DATABASES ARE NOT USED EFFECTIVELY OR CONSISTENTLY

Staff cited the tracking of mitigation monitoring activities as an obstacle to compliance with District compensatory mitigation requirements. Mitigation compliance was not verifiable for four of the mitigation requirements for the SMP1. The impacts and mitigation requirements for bank planting, large woody debris, minor work activities, and vegetation were not recorded or tracked. The amount of mitigation for these activities was tracked; however, because the impacts were not recorded, it is not possible verify compliance with the mitigation obligations.

Figure 2.8-1: Monitoring Timeframes and Costs for Mitigation



7 SCVWD projects have mitigation monitoring timelines of **100 years**

EXAMPLES:

GUADALUPE PROGRAM
$600K per year[1]
80 years remaining
TOTAL: **$48 MILLION**

COYOTE CREEK
$162.9K per year[2]
71 years remaining
TOTAL: **$11.5 MILLION**

Maximum timeline for Benchmarking Agency project: **10 years**

* Note: Every bar represents a project

[1] This number is based on an estimate provided by the District.

[2] This number is based on estimated costs provided in Ali Adeeb (2002). This number is based on averaging the estimated costs for monitoring for the Fiscal Years 2014 to 2018.

Currently, compensatory mitigation data are tracked in several databases, including the following:

1. Mitigation and Monitoring Activities Database (MMAD): an in-house Oracle Database
2. Ecological Monitoring Information Management Systems (EMIMS)
3. WPMS Permit Database
4. Vegetation Management GIS Database
5. 2014 Compensatory Mitigation Compliance Audit

The District lacks a unified database that has complete information that can be used by District staff. Ideally, the database would include the following information:

1. Project name and description
2. Habitat type or species associated with compensatory mitigation
3. Proposed impact acreages
4. Final impact acreages
5. Environmental document
6. CEQA mitigation measures
7. Regulatory agency permits
8. Permit conditions, by agency
9. Verification of compliance with mitigation measures and permits conditions with annual updates
10. Required monitoring timeframes
11. Geographic Information System (GIS) element
12. Agency sign-off

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3 CONCLUSIONS

3.1 DISTRICT IS MEETING ITS OBLIGATIONS BUT OBLIGATIONS AND COMPLIANCE ARE NOT EASY TO VERIFY

All mitigation measures have been implemented, although a few mitigation areas are not yet meeting the success criteria and some new projects have not initiated or completed mitigation. The District currently tracks mitigation compliance in several databases, none of which have complete information about mitigation obligations or are used routinely by staff. The District is tracking and monitoring large amounts of data in a variety of databases, but the data are not necessarily being used to inform subsequent documents and future negotiations.

3.2 SMP2 MAY BE MORE TIME-CONSUMING AND COSTLY TO IMPLEMENT BECAUSE IT IS NOT FUNCTIONING AS A PROGRAM

The District has invested substantial time and effort in negotiating the SMP2. The negotiation process was hampered by the District's late implementation of required mitigation: compensation land was difficult to acquire. Land acquisition is outside of the District's mission and would be better conducted by land management specialists.

The process to approve each project may take longer than expected because the agencies have the discretion to change mitigation ratios. Mitigation may be more expensive because ratios are higher and can be changed by the agencies.

3.3 RENEGOTIATION OF THE 100-YEAR MONITORING REQUIREMENTS IS IMPORTANT BECAUSE COSTS OF MITIGATION AND MONITORING ARE RISING EXPONENTIALLY

In 2002, the *Biological Surface Water Quality Monitoring Activities Evaluation Report* (Ali Adeeb 2002) review showed that mitigation monitoring was estimated to be $19 million for the 2018 fiscal year. These costs and requirements are continuing to increase. It is estimated that the District will spend approximately $59.5 million monitoring projects for 100 years (i.e., Guadalupe Creek and Coyote Creek projects).

3.4 DISTRICT STAFFING IS INADEQUATE TO TRACK AND MONITOR MITIGATION OBLIGATIONS

The mitigation and monitoring requirements continue to increase. The District staff commonly indicated more time was needed to adequately track and monitor compliance, and that there are additional aspects of compliance that should be added (for example, consolidating databases and adding a rigorous GIS component). This audit focused on compensatory mitigation only. Every CEQA document has additional mitigation measures, which may or may not be verified by anyone other than the District construction team or contractor. Environmental compliance is not being tracked thoroughly or consistently by the same staff

3.5 BENCHMARKING AGENCIES HAVE SIMILAR COMMITMENTS FOR GREATER MITIGATION DUE TO EXTENUATING CIRCUMSTANCES

The District currently lacks a method for efficient implementation and tracking of compensatory mitigation. Although the District is in compliance with its mitigation requirements, the District faces many challenges, including:

- Large mitigation ratios with long monitoring timeframes, which translate to millions of dollars per year in monitoring
- Unique mitigation measures
- Lack of programmatic guidance and implementation for the SMP2
- Ineffective negotiation processes for developing mitigation measures and permit conditions
- Inefficient tracking of impacts and mitigation requirements
- Lack of collaboration between District units

Inefficient mitigation implementation results in additional costs. Even small increases in mitigation ratios result in millions of dollars of additional mitigation costs. Efficient mitigation implementation is necessary for budgetary purposes and to ensure proper compliance with environmental regulations.

4 RECOMMENDATIONS

Recommendations were developed through an evaluation of the audit findings and an analysis of the District and benchmark agency interviews. Table 4.1-1 presents the recommendations resulting from the audit. Each recommendation is tied directly to a finding presented in Section 2. Table 4.1-1 also provides specific measures that the District can take to fulfill the recommendations made in the audit. Refer to Appendix D for a detailed description and discussion of the recommendations.

Table 4.1-1: Findings and Recommendations

Findings	Recommendation	Approach	Timeline
	1. Improve the mitigation measure and permit negotiation process		
Finding 1: District is meeting or exceeding its mitigation obligations, with some obligations in process **Finding 2**: Small increases in mitigation ratios result in millions of dollars in additional mitigation costs **Finding 7**: The District has unique mitigation measures **Finding 8**: District mitigation monitoring timeframes are longer than other public agencies	**Recommendation 1a:** Revisit and implement previous recommendations made for the permit negotiation process. • The District does not use the knowledge obtained from monitoring to leverage better deals when negotiating with regulatory agencies.	Document impacts, compare to predictions, and identify excess (or deficient) implementation of mitigation. Analyze the effectiveness of mitigation for habitats and species.	1 year
	Recommendation 1b: Use an outside CEQA lawyer to review and negotiate mitigation measures, land management plans, and conservation easements to ensure the efficient, cost-effective, and timely completion of mitigation, land management plans, and conservation easements.	Consider a request for proposals for CEQA and permitting assistance to select the attorney/firm with the best qualifications for reviewing CEQA documents and negotiating environmental permits.	3 months
	Recommendation 1c: The District environmental planners should negotiate permits with the regulatory agencies.	Issue directive across divisions.	Immediately
	Recommendation 1d: Allow more time for permitting.	Conduct schedule check-ins between Project Managers and environmental planners. Adjust schedule if negotiations are not complete.	Immediately
	Recommendation 1e: Improve continuity in environmental participation from design phase through construction.	Prescribe requirement that environmental planners (or consultants under direction of planners) oversee mitigation monitoring and reporting (additional staff will be required).	Immediately
	Recommendation 1f: Enhance on-site habitat; if not possible, fund habitat acquisition through a third-party.	Identify multiple third-parties with whom to partner, such as The Nature Conservancy, open-space districts, land conservancies, and Wildlands, etc. Develop agreements in advance.	6 months

Table 4.1-1 (*Continued*): Findings and Recommendations

Findings	Recommendation	Approach	Timeline
2. Track impacts and mitigation implementation to avoid expending more than required on mitigation			
Finding 2: Small increases in mitigation ratios result in millions of dollars in additional mitigation costs **Finding 8**: District mitigation monitoring timeframes are longer than other public agencies **Finding 9**: Multiple District databases are not used effectively or consistently	**Recommendation 2a:** Revisit and implement previous recommendations regarding tracking of mitigation activities consistently and in one database. • There are flaws in the District's tracking of mitigation monitoring activities and there is a need for better data management structures and procedures, including consistent staff access to monitoring data.	Build a document management system to provide access to environmental documents. Mandate that all planners and Environmental Mitigation and Monitoring staff incorporate data on a regular basis, and have easy access to database.	6 months Immediately
	Recommendation 2b: Define actual impacts from previous projects and compare to mitigation implemented to determine whether excess mitigation is available for other projects.	Have the Vegetation Management and/or Environmental Mitigation and Monitoring staff verify, where possible, previous impacts and add to database.	6 months
	Recommendation 2c: Consolidate the Mitigation Tracking Databases and include a GIS Element.	The District is in process of creating this database.	< 1 year

Table 4.1-1 (*Continued*): Findings and Recommendations

Findings	Recommendation	Approach	Timeline
3. Improve District structure and procedures for permitting			
Finding 3: SMP2 does not function as a program with a programmatic permit **Finding 6**: District mitigation for the SMP is more complex and has higher compensation ratios than the Sonoma County Water Agency SMP	**Recommendation 3a:** The District should revisit and implement previous recommendations regarding improving staff collaboration: • The District needs qualified staff whose primary assignment is to integrate the District's monitoring efforts into a unified, efficient, and effective program • The District lacks communication between engineering Project Managers and staff scientists. Project Managers focus on obtaining regulatory approvals or settlements quickly so that projects, operations, and maintenance can proceed. Staff scientists focus on providing accurate and defensible scientific and technical analysis. Because of these differing priorities it is important that there is a process to facilitate communication and collaboration between Project Managers and staff scientists.	The District has created an Environmental Mitigation and Monitoring Unit to manage monitoring. However, the work is being monitored by different people in different ways. Prescribe that Project Managers attend monthly meetings with planners, scientists, and mitigation implementation teams.	2 months
	Recommendation 3b: Specify procedures for CEQA planners to conduct mitigation monitoring or reporting following completion of the CEQA document.	Define procedures, tasks, and staff roles for mitigation monitoring, tracking, verification, and reporting.	3 months

Table 4.1-1 (*Continued*): Findings and Recommendations

Findings	Recommendation	Approach	Timeline
	3. Improve District structure and procedures for permitting		
Finding 3: SMP2 does not function as a program with a programmatic permit **Finding 6**: District mitigation for the SMP is more complex and has higher compensation ratios than the Sonoma County Water Agency SMP	**Recommendation 3c:** Increase collaboration between environmental units.	Prescribe that Environmental Planners provide Vegetation Management Unit staff the opportunity to comment on the mitigation measures at the Administrative Draft CEQA document phase. Planners should provide rationale for recommendations not incorporated. Formalize monthly meetings with all environmental practitioners, including the Environmental Mitigation and Monitoring Unit, Water Resources Planning and Policy Unit, SMP Unit, Vegetation Management Unit, Environmental Planning Unit, and the Water Utilities/Water Resources Planning Unit to discuss implementation issues and improve mitigation measures and negotiations.	Immediately 2 months
	Recommendation 3d: Hold in-house training for CEQA and regulatory requirements and the District's mitigation and maintenance process.	Tailor training to District processes and requirements. Tailor training to specific topics such as definition of mitigation, agency regulations, negotiation, facilitation, and mediation. Train engineers.	6 months
	Recommendation 3e: Future SMPs should define a process similar to the SCWA SMP where interim agency authorizations are not required, in order to function more like a program.	The District may want to discontinue the programmatic approach and rely on a Habitat Compensation Plan (HCP).	5 -10 years
	Recommendation 3f: The District should close out mitigation for projects that have been completed.	Send letter to agencies stating that unless the District is notified to the contrary, the District will consider the mitigation completed.	6 months

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APPENDIX A

Objectives, Scope, and Methodology

APPENDIX A: OBJECTIVES, SCOPE, AND METHODOLOGY

OBJECTIVES

As a governmental organization entrusted to serve the public, the District is responsible for providing safe, clean water for a healthy life, environment, and economy for Silicon Valley and all the communities that the District serves. To fulfill that mandate, the District must comply with regulatory requirements from several state and federal resource agencies, including establishing and maintaining compensatory mitigation for environmental impacts from projects and programs.

Towards that end, the District hired Panorama Environmental, Inc. to perform an independent Mitigation and Monitoring Compliance Audit and Benchmarking Review to evaluate whether the District is meeting applicable legal and regulatory requirements related to its mitigation obligations, and to benchmark against other public agencies. The audit focuses on the District's operation and maintenance activities, and capital projects in both the watershed and water utility divisions, including all mitigation associated with the District's multi-year SMP.

SCOPE

The scope of the Compensatory Mitigation and Monitoring Compliance Audit includes:

1. Inventorying all compensatory mitigation requirements for the District's Watershed and Water Utility operations.
2. Reviewing and assessing the extent to which the District is meeting its mitigation obligations as identified in this audit.
3. Identifying best practices and areas for continued improvement and efficiency.
4. Benchmarking the District's mitigation obligations with other comparable agencies.

METHODOLOGY: COMPENSATORY MITIGATION AUDIT

Data Collection

CEQA Documents and Regulatory Permits

Data Sources

Identification of Relevant Projects. The District's compensatory mitigation is defined in CEQA documents and regulatory permits for specific projects. The District projects to be included in this audit were identified through the Panorama proprietary CEQA document database, the State Clearinghouse CEQAnet website (www.CEQAnet.ca.gov), and discussions with District staff. The District performed a search on their internal permit database for the keywords: U.S. Fish and Wildlife Services, California Department of Fish and Wildlife, Regional Water Quality

Control Board, and Army Corps of Engineers. The District provided the search results to Panorama. The permits were reviewed and the following projects were identified:

1. SMP
2. Adobe Creek Watershed Foothill Expressway
3. Adobe Creek Watershed Upper Reach 5
4. Calabazas Creek Flood Project
5. Guadalupe Creel Restoration Project
6. Guadalupe River Project (Downtown)
7. Lower Coyote Creek Flood Control Project: Reach 1
8. Lower Coyote Creek Flood Control Project: Reach 2
9. Lower Coyote Creek Flood Control Project: Reach 3
10. Lower Guadalupe River Flood Protection Project
11. Lower Silver Creek Watershed Project
12. Matadero/Barron Creeks Long-Term Remediation Project
13. Reconstruction of Bollinger Road Bridge Over Calabazas Creek
14. Upper Guadalupe River Flood
15. Jacques Gulch Restoration Project
16. Lenihan Dam Outlet Modification Project
17. Almaden Reservoir/Dam Maintenance Project
18. Anderson Dam/Dam Maintenance Project
19. Stevens Creek Reservoir/Dam Maintenance Project
20. Uvas Dam and Chesbro Dam/Dam Maintenance Project
21. Vasona Reservoir/Dam Maintenance Project

Identification of Mitigation Obligations. Panorama identified District compensatory mitigation requirements by reviewing the following documents:

1. The 2014-2023 SMP Manual (which includes all of the requirements of the 2001 SMP)
2. CEQA documents, including mitigation and monitoring program (MMP) reports for District projects
3. U.S. Army Corps of Engineers, Clean Water Act Section 404 permits
4. U.S. Fish & Wildlife Services permits
5. California Department of Fish and Wildlife, Section 1600 Lake and Streambed alteration agreements
6. San Francisco Bay and Central Coast Regional Water Quality Control Board, Clean Water Act Section 401 permits
7. San Francisco Bay Conservation and Development Commission District permits

Verification of Mitigation Compliance. The District's compensatory mitigation compliance status was verified by literature review; no field verification was conducted. The following sources of information were reviewed to verify compliance:

1. The 2014-2023 Stream Maintenance Program Manual
2. Various Mitigation Monitoring Reports
3. Vegetation Management GIS Database
4. Permit renewals for the 2002 SMP
5. Lower Coyote Creek Flood Control Project Request for Agency, Army Corps of Engineers project mitigation approval letter
6. Lower Coyote Creek Flood Control Project Request for Agency, California Department of Fish and Wildlife project mitigation approval letter

The District is required to compensate for the loss of habitat with the creation, enhancement, restoration, or purchase of the ecological community that was lost. Compensatory mitigation for wildlife species is defined at the habitat level.

Mitigation compliance was not verified for the five following Water Utility projects because the District is in its initial phases of mitigation and documents to verify their compliance are not available:

1. Almaden Reservoir/Dam Maintenance Project
2. Anderson Dam/Dam Maintenance Project
3. Stevens Creek Reservoir/Dam Maintenance Project
4. Uvas Dam and Chesbro Dam/Dam Maintenance Project
5. Vasona Reservoir/Dam Maintenance Project

Mitigation compliance was not verifiable for four of the compensatory mitigation requirements for the SMP. These four requirements include bank planting, large woody debris, minor work activities, and vegetation. Compensatory mitigation for these requirements occurred at different times across the life of the SMP and was treated on a case-by-case basis. While compensatory mitigation was tracked, impacts were not tracked, thereby precluding the possibility of comparing mitigation acquired to the area impacted. Data from the vegetation management GIS database and data from the 2014-2023 Stream Maintenance Program Manual verified that mitigation was acquired for these four requirements; however, because the District did not track the impacts and required mitigation, it was not possible to verify their mitigation compliance. Additionally, there were 16 habitats for which their compensatory mitigation was quantified. The following 16 habitats were identified in environmental documents and permits:

1. California Red-Legged Frog habitat
2. Giant Reed Control
3. Marsh
4. Nontidal Marsh
5. Nontidal Wetland: Freshwater Wetland Creation/Restoration
6. Nontidal Wetland: Stream and Watershed Protection
7. Riparian
8. River Bank
9. Riparian/upland/wetland/waters mix
10. Smooth Cordgrass Control
11. Spawning Gravels
12. Shaded Riverine Aquatic Cover
13. Tidal Wetland
14. Trees
15. Upland
16. Wetland

Some permits did not specify one habitat requirements and instead required mitigation for a mix of riparian, upland, wetland, and waters habitat; projects with requirements for mixed habitats were consolidated to one mixed habitat category.

Definition of Compliance. For the purposes of this Audit the District's performance in meeting its mitigation obligations is classified into three categories:

- Mitigation compliant and complete
- Mitigation partially compliant and/or not meeting objectives
- New project obligations not complete

Mitigation that is compliant and complete refers to mitigation obligations that the District has fully completed. Mitigation that is compliant and in process refers to the District's outstanding mitigation obligations that are on schedule to be completed as required by the permits and agency agreements. The new project obligations, not complete category refers to projects that have been recently permitted and, which have just begun to establish mitigation to compensate for the project impacts. It is too early in the mitigation process to determine the District's compliance for these projects.

Review of Previous Monitoring Activities Reports. Panorama reviewed a previous monitoring evaluation report to consider recommendations that were made to the District. The report, "Biological and Surface Water Quality Monitoring Activities Evaluation Report," was prepared by Neddal Ali-Adeeb et al. (2002). The report was commissioned by the District General Manager because the quantity and complexity of the District's biological and surface water quality monitoring was increasing rapidly. The District did not have an overall program, systems, or capacity to synthesize, interpret, or report the data in a manner useful to the District.

Data Management

Compensatory mitigation requirements were defined at the habitat level (described above) to reflect the regulatory permit mitigation requirements. The compensatory mitigation requirements, mitigation compliance status, and monitoring requirements were recorded in an Excel master database (Appendix E). The following data were recorded for each project:

1. Project name
2. Document
3. Year of the document
4. Date that the document was received from District
5. Habitat type associated with the compensatory mitigation
6. Impact area (acres)
7. Mitigation ratio (acres of mitigation: acres of impact)
8. Mitigation required (acres)
9. Mitigation deficient (acres)
10. Required monitoring time frame (years)
11. Success criteria (percent cover at year)
12. Percentage cover acquired
13. Compliance

Staff Interviews

District staff were interviewed in April, May, and August 2014. The purpose of the interviews was to identify relevant projects, programs, and the compensatory mitigation compliance status of the District's projects and programs. Information on compliance issues or gaps and staff recommendations were obtained for the District's mitigation program during interviews.

A total of 18 District staff members were interviewed. Table A-1 lists the interviewees, and their division, unit, and role. Panorama interviewed staff members from various divisions and units to obtain a diverse range of perspectives. A standard questionnaire was used for each interview to maintain consistency in data collection (Appendix G). Two members of Panorama staff conducted each interview. Laurie Hietter conducted the interviews with either Tania Treis or Susanne Heim. Each interviewee spoke with Panorama staff for approximately 1 hour. The two Panorama staff members conducting the interviews both recorded responses.

Table A-1: List of District Staff Members Interviewed

Staff Member	Title	Division	Unit	Date Interviewed
Environmental Mitigation and Monitoring				
Ryan Heacock	Environmental Planner II	Watershed Stewardship and Planning	Environmental Mitigation & Monitoring	May 8, 2014
Navroop Jassal	Biologist III	Watershed Stewardship and Planning	Environmental Mitigation & Monitoring	April 15, 2014
Doug Padley	Biologist III	Watershed Stewardship and Planning	Environmental Mitigation & Monitoring	May 27, 2014
Lisa Porcella	Environmental Services Manager	Watershed Stewardship and Planning	Environmental Mitigation & Monitoring	April 15, 2014 & May 27, 2014
Doug Titus	Senior Water Resource Specialist	Watershed Stewardship and Planning	Environmental Mitigation & Monitoring	April 15, 2014
Water Resources Planning & Policy				
Brian Mendenhall	Project Manager	Watershed Stewardship and Planning	Water Resource Planning & Policy	April 15, 2014
Stream Maintenance Program				
Jennifer Codianne	Vegetation Programs Specialist	Watershed Operations & Maintenance	Stream Maintenance Program	April 15, 2014
Sunny Williams	Environmental Planner II	Watershed Operations & Maintenance	Stream Maintenance Program	August 26, 2014

Table A-1 (*Continued*): List of District Staff Members Interviewed

Staff Member	Title	Division	Unit	Date Interviewed
Vegetation Management				
Rick Austin	Vegetation Programs Specialist	Watershed Operations & Maintenance	Vegetation Management	April 15, 2014
Judy Ingols	Senior Field Operations Administrator	Watershed Operations & Maintenance	Vegetation Management	April 15, 2014
Mark Wander	Unit Manager for Vegetation Field Operations	Watershed Operations & Maintenance	Vegetation Management	April 15, 2014
Environmental Planning Unit				
Mike Coleman	Environmental Planner II	Watershed Management	Environmental Planning	May 13, 2014
Kurt Luenburger	Environmental Planner II	Watershed Management	Environmental Planning	May 13, 2014
James Manitakos	Environmental Planner II	Watershed Management	Environmental Planning	May 6, 2014
Mike Martin	Environmental Planner II	Watershed Management	Environmental Planning	May 7, 2014
Water Resources Planning				
Elise Latedjou-Durand	Environmental Planner II	Water Utility	Water Resources Planning	May 7, 2014
Debra Caldon	Environmental Services Manager	Water Utility	Water Resources Planning	May 13, 2014
Tiffany Hernandez	Environmental Planner II	Water Utility	Water Resources Planning	May 13, 2014
Terry Neudorf	Sr. Environmental Planner	Water Utility	Water Resources Planning	May 7, 2014

Data Analysis

CEQA Mitigation Measures, Permit Condition, and Monitoring Reports

Mitigation Requirement Analysis

The master database was designed to facilitate data analysis and to demonstrate compensatory mitigation by project, habitat, CEQA requirements, regulatory permit requirements, mitigation completed, monitoring time frame, and monitoring reporting. The master database is provided in Appendix E. The table was used to analyze the mitigation requirements for each project.

Compensatory Mitigation Compliance Analysis

The database was reviewed to understand mitigation compliance status. The data were analyzed across the parameters listed in Table A-2. Missing data and/or incomplete mitigation implementation was further researched. Additional District reports were requested and reviewed, and District staff were queried to determine the reasons for lack of compliance.

Staff Interviews

The data received from interviewed staff were categorized and tabulated (see Appendix G for summary of comments). Panorama identified recurring themes in the interviewee responses and divided the comments into areas of success and areas for improvement. The areas for improvement were divided into eleven categories to facilitate analysis of the interviews. The categories that were used to organize the staff input are provided in Table A-3. Categorizations were recorded in an Excel spreadsheet, along with the comment, the name of the commenter, and the division and unit of the commenter.

Each staff member was assigned a number in order to maintain confidentiality.

Table A-2: Mitigation Data Analysis

Parameter	Analysis Method
Habitat Type	Compared total acres or linear feet of mitigation required for each habitat type to the total acres of habitat created, enhanced, restored, or purchased by the District
Division	Compared total acres of mitigation required by each Division to the total acres of habitat created, enhanced, restored, or purchased by the District
Project	Compared the total acres of mitigation required for each project to the total acres of habitat created, enhanced, restored, or purchased by the District
Monitoring Timeframe	Identified the maximum number of years of monitoring required for each project and calculated the percentage of projects with monitoring time frames of 5, 8, 10 and 100 years
Variations in Mitigation Required	Identified projects and habitat types where the mitigation requirements and compensation ratios differed across agency permits (e.g., one agency requires 5 acres of mitigation while another requires 10 for the same impact)

Assumptions and Limitations

A number of factors may have influenced the findings and results of this audit. The following are general assumptions or limitations that have influenced the outcome of the audit:

1. All District documents with compensatory mitigation may not have been provided to Panorama
2. Panorama assumes that the documents provided by the District contained all the information needed to make conclusions about mitigation compliance.

3. The compensatory mitigation audit was limited by the documents that were made available by the District. Not all documents were available including the SMP IS/MND from 1999.
4. No field work was conducted to verify mitigation compliance or revegetation success. This audit does not include any information on actual areas of impact because this information is not currently being tracked by the District. The mitigation requirements in this audit reflect the impact areas defined in the permits and MMRPs. The actual areas of impact may be less than the permitted impact.
5. Panorama did not have access to the District databases, including the mitigation and monitoring database (MMAD) and the permit database.
6. Panorama was unable to distinguish whether the District or the regulatory agencies were defining the mitigation requirements.
7. The people interviewed represented a broad range of views held on mitigation monitoring at the District.
8. All answers provided were complete and honest based on the knowledge of the interviewee.
9. The interviewees generally responded to questions that were included in the interview questionnaire and the questions form the context for the responses. There may be pertinent information about the District's compensatory mitigation program that was not obtained because certain questions were not asked.

Table A-3 Description of Staff interview Comment Categories
Compensatory Mitigation Issues
Defining Mitigation
Compensatory Mitigation Reporting & Tracking
Need for Adequate Surveys
Mitigation Site Acquisition and Credit
Issues with Regulatory Agencies
Communication with Agencies
Permits
District Organization Issues
Project Management and Performance Standards
Information Availability
Internal Communication and Structure
Communication with Upper Management
Factors to Consider in Budgeting

METHODOLOGY: BENCHMARKING REVIEW

Data Collection for Benchmarking Review

Six agencies were identified as suitable to benchmark mitigation against those of the District. Suitable benchmarking agencies were considered to be those agencies implementing similar programs as the District, with permits and mitigation commitments for effects to similar environmental resources. The determination of which agencies were chosen for benchmarking was based on recommendations from District staff, review of the CEQAnet database and agency websites for recent projects, and previous contacts made by Panorama with comparable agencies.

Benchmarking Agencies

The following six agencies were chosen to benchmark against the District:

1. Contra Costa County Department of Public Works (CCCO)
2. Contra Costa Water Agency (CCWA)
3. East Bay Municipal Utility District (EBMUD)
4. Marin Municipal Water District (MMWD)
5. San Francisco Public Utility Commission (SFPUC)
6. Sonoma County Water Agency (SCWA)

Table A-4 provides an overview of each benchmarking agency.

Review of Benchmarking Projects Mitigation

Data Sources

Identification of Relevant Projects. The CEQAnet database was consulted to identify projects and CEQA documents completed by the benchmark agencies in the past 3 years. A total of 13 projects were identified to benchmark against District projects.

Identification of Mitigation Obligations. Mitigation obligations for the benchmarking agency projects were identified by reviewing CEQA documents and regulatory permits. CEQA documents were obtained through online queries, including queries to the benchmarking agency website.

Regulatory permits were also obtained to benchmark permit conditions and compare them to the mitigation measures in the CEQA documents. The permits were obtained from:

1. Formal requests to SFRWQCB for 401 permits and to CDFW for 1600 permits
2. North Coast Regional Water Quality Control Board (NCRWQCB) website
3. Benchmarking agencies

Table A-5 provides a summary of the data sources that were obtained for the different benchmarking projects.

Table A-4: Benchmarking Agency Profiles

Agency	Customers	Geographic Area	Types of Projects
CCCO	1,080,000	802 square miles within Contra Costa County	Stream Maintenance Road Maintenance Flood Control Sanitation Underground Utility Building and Landscaping County Park Maintenance Property Acquisition Street Light Maintenance Watershed Management
CCWA	Approximately 500,000	214 square miles within Eastern and Central Contra Costa County	Dams Water Treatment Water Delivery Pump Stations Reservoir Rehabilitation Canal Replacement Pipelines
EBMUD	1,300,000 drinking water customers and 650,000 wastewater customers	331 square miles of water service area and 88 square miles of wastewater service area along the San Francisco Bay's eastern shore from Richmond to San Leandro, both within Alameda and Contra Costa Counties	Water Treatment Water Delivery Pipelines Aqueducts Reservoir Replacement Dams Pump Stations
MMWD	186,000	147 square miles within South and Central Marin County	Water Treatment Water Delivery Pipelines Water Storage Firefighting Water Systems
SFPUC	2,600,000	San Francisco, Alameda, Santa Clara, and San Mateo Counties	Water Treatment Water Delivery Pipelines Dams Firefighting Water Systems
SCWA	600,000	Portions of Sonoma and Marin Counties	Water Treatment Water Delivery Pipelines Flood Control Stream Maintenance Groundwater Planning

Table A-5: Benchmarking Review Data Sources

Benchmarking Agency	Projects	Data Source
CCCO	Norris Canyons Estate San Catanio Creek Tributary Stabilization Project	SFRWQCB 401 permit CDFW 1600 permit
	The Fernandez Ranch Public Access and Creek Restoration Project	SFRWQCB 401 permit
CCWA	Alternative Intake Project	CDFW 1600 permit
	Los Vaqueros Reservoir Expansion Project	CDFW 1600 permit
EBMUD	San Pablo Dam Seismic Upgrade Project	ACOE 404 permit SFRWQCB permit USFWS Biological Opinion CDFW 1600 permit
MMWD	Devils Gulch Water Quality Improvement Project	SFRWQCB 401 permit
	Phoenix Lake Road Pipeline Seismic Reliability Project	SFRWQCB 401 permit
SFPUC	Calaveras Dam Replacement Project	A SFRWQCB 401 Permit was obtained for each SFPUC project that was reviewed Information about ACOE, USFWS, and CDFW mitigation was obtained directly by SFPUC staff. Permits from the ACOE, USFWS, and CDFW were not obtained.
	Pipeline Seismic Upgrade Project	
	San Antonio Backup Pipeline Project	
SCWA	SMP	NCRWQCB 401 permit CDFW 1600 permit NMFS Biological Opinion SCWA SMP Manual SCWA Annual Mitigation Monitoring Report (2009, 2010, 2011, 2012, and 2013).
	Matanzas Creek Detention Reservoir Sediment Removal Project	NCRWQCB 401 permit
	Santa Rosa Creek Diversion Project	NCRWQCB 401 permit

Data Management

Mitigation for benchmarking projects was defined at the habitat level (i.e., wetland, riparian, open water, upland). This approach reflects the regulatory permit mitigation requirements and is consistent with the data collected from the compensatory mitigation audit.

The mitigation and monitoring requirements were recorded in an Excel database (Appendix E). The following data were recorded for each project:

1. Benchmarking agency
2. Project name
3. Mitigation habitat type

The following data were recorded four times, once for each of the permitting agencies: RWQCB, ACOE, USFWS, and CDFW:

1. Permanent impact area (acres)
2. Temporary impact area (acres)
3. Mitigation Ratio
4. Mitigation Required
5. Monitoring time frame
6. Success Criteria

Interviews with Benchmarking Agencies

Interviews with the benchmarking agencies' staff were conducted between May and August 2014. The purpose of the interviews was to identify relevant projects, programs, and the mitigation compliance status of the benchmarking agency's projects and programs.

Four of the six benchmarking agencies were interviewed: CCCO, EBMUD, MMWD, and SCWA. SFPUC and CCWA declined to complete the interview form due to other commitments. A standard questionnaire was used for each interview to maintain consistency in data collection (Appendix G). Two members of Panorama staff conducted each interview. Laurie Hietter conducted the interviews with Tania Treis, Susanne Heim, or Leo Mena. Each interviewee spoke with Panorama staff for approximately 1 hour. The two Panorama staff members conducting the interviews both recorded responses.

Benchmarking Review Analysis

The benchmarking review provides the following analysis:

1. District mitigation is evaluated for internal consistency. Mitigation requirements for the SMP1 and Watershed and Water Utility projects are compared. The Water Utility division did not have many projects with compensatory mitigation; therefore, the comparison between the Water Utility division and the other divisions was limited. . The mitigation ratios for the SMP2 are compared to the SMP1.

2. The District SMP (SMP1 and SMP2) is compared with the SCWA SMP. Since SMPs are unique in their scope of work, these two projects are benchmarked against each other and discussed separately from other projects to ensure appropriate comparison. Mitigation ratios, total mitigation area, and the number of required habitats for mitigation are compared between the District SMPs and the SCWA SMP. Data from both the District SMP1 and the District SMP2 are used in this analysis. The SMP1 provides information about the total area of impacts and the SMP2 provides information about the mitigation ratios used to defined mitigation.

3. The District Watershed and Water Utility projects are compared with similar projects from the benchmarking agencies.
4. Monitoring time frames for District projects are compared with the monitoring time frames for benchmarking projects.
5. The consistency of mitigation measures required by the regulatory agencies for the benchmarking projects is evaluated.
6. Findings from the benchmarking agency interviews are analyzed to identify similarities and differences in approaches to completing mitigation.

Analysis of Consistency in District Mitigation

SMP

The acres of impact, mitigation ratios, and total area of required mitigation were recorded for the SMP1. Data was obtained from the Compensatory Mitigation Audit. Mitigation ratios for different activity or habitat requirement were compared with each other to identify any mitigation ratios that were inconsistent with the other requirements.

Watershed and Water Utility Project

The acres of impact, mitigation ratios, and total area of required mitigation were recorded for Watershed and Water Utility projects. Data was obtained from the Compensatory Mitigation Audit. Mitigation ratios from the same habitat requirement were compared across different projects to identify any mitigation ratios that were inconsistent with other project requirements.

SMP Benchmarking

The SMP is a unique type of project that is unlike smaller flood control projects or pipeline projects. The District SMP was therefore benchmarked against the SCWA SMP.

Comparison of Mitigation Ratios and Total Mitigation Required

The mitigation ratios and the total area of required mitigation were determined through the review of SMP manuals, permits, and annual SMP monitoring reports. The following sources were used to determine the required mitigation ratios and area:

- District 2014-2023 SMP Manual
- District Army Corps of Engineers 404 Permit
- District Central Coast Regional Water Quality Control Board 401 permit
- District USFWS Biological Opinion
- District NMFS Biological Opinion
- District BCDC Permit
- Results from the Compensatory Mitigation Audit
- SCWA SMP Manual
- SCWA 2009, 2010, 2011, 2012, 2013 annual SMP monitoring reports

Watershed and Water Utility Projects Benchmarking

The District and the benchmarking Watershed and Water Utility projects were compared to determine any inconsistencies in the application of mitigation obligations. The differences in the mitigation ratios, total area of mitigation required, and the number of habitats for which the agency is required to mitigate were evaluated.

Monitoring Time Frames Benchmarking

The benchmarking agency monitoring timeframes were researched as well as mitigation. The monitoring time frames for the benchmarking projects were reviewed by determining the maximum number of years for which one project was required to monitor. The maximum number of years required for mitigation monitoring was determined by using the pivot table function in Excel.

The longest monitoring time frame was used to define the monitoring time frame of the project when there were multiple monitoring time frames for different habitats. There was just one instance with the SFPUC Calaveras Dam Replacement Project where a benchmarking agency project had multiple monitoring time frames that were not the same.

Once the monitoring time frames for the projects were established, the number of projects with the same monitoring time frames was summed. The number of benchmarking projects with monitoring time frames of 3, 5, 8, 10 and 100 years were then compared to the number of District projects with the same monitoring time frames. The monitoring time frames for the District projects were identified in the Compensatory Mitigation Audit.

Comparison of Regulatory Agency Requirements

The benchmarking Excel databases were reviewed for inconsistencies in mitigation. Any differences in mitigation ratios, mitigation area, monitoring time frame, or performance criteria were identified.

Analysis of Benchmarking Agency Interviews

The data received from interviewed benchmarking agency staff were analyzed to identify differences and similarities between the benchmarking agencies and the District. The scope of the benchmarking agency projects and the procedure for permit negotiation was compared with the District.

APPENDIX B

Findings from the Compensatory Mitigation Audit

APPENDIX B: FINDINGS FROM THE COMPENSATORY MITIGATION AUDIT

DOCUMENT REVIEW RESULTS

Project Impacts

The environmental documents and permits discuss the impacts of the District project activities. The District is required to compensate for the loss of habitat with the creation, enhancement, restoration, or purchase of the ecological community that was affected by project construction or maintenance activities.

Compensatory Mitigation Requirements

Compensatory Mitigation Habitat Types

There are a total of 20 different compensatory mitigation requirements for District project impacts. Four of these compensatory mitigation requirements for the SMP—bank planting, large woody debris, mitigation for minor work activities, and vegetation —were not quantified numerically because data were not available. The remaining 16 habitats that required mitigation and monitoring are summarized in Table B-1.

Compensatory mitigation for 13 of the 16 habitat types identified in Table B-1 was defined in total acres by project. Mitigation commitments for shaded riparian aquatic cover and river bank habitat are tracked in linear feet and mitigation commitments for trees are tracked in number of trees. Compensation ratios (acres preserved or enhanced for compensation to acres affected by District project construction or maintenance) were not defined for all projects. The total acreage affected was calculated through an initial estimation of project impacts. The actual project effect was not always determined or tracked by the District. When the actual project impact is determined, the compensatory mitigation requirement is not revised to reflect the lower mitigation requirement due to the lower project impact. Excess compensatory mitigation is neither tracked, nor credited.

Figures B-1 through B-4 show the total acres of compensation commitments for the 16 habitat types. Stream and watershed protection, California red-legged frog habitat, giant reed control, riparian, marsh, and tidal wetland habitats comprised the largest acreage of compensatory mitigation commitments.

Table B-1: Summary of Compensatory Mitigation Requirements by Habitat

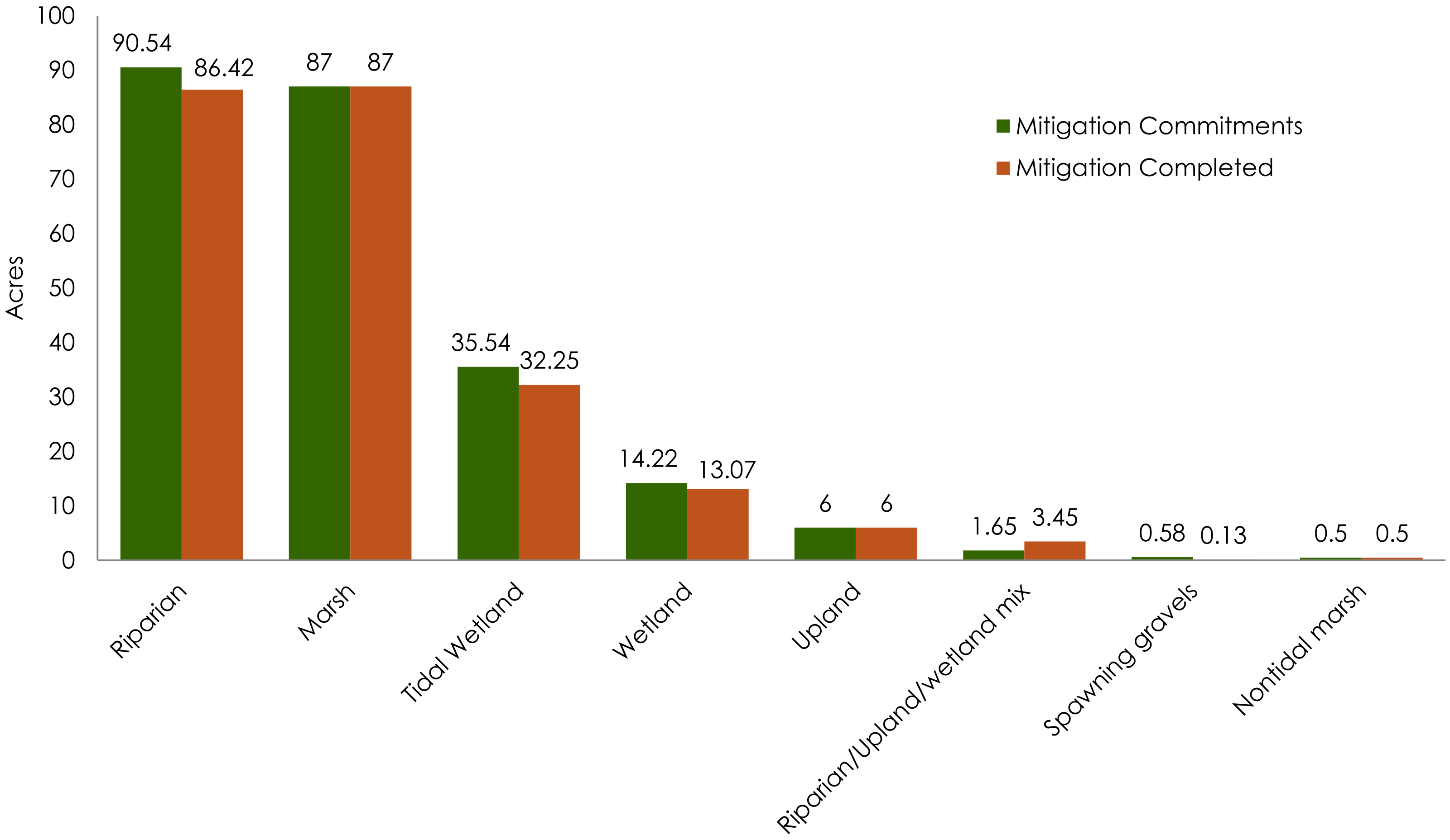
Habitat	Mitigation Unit	Total Mitigation	Number of Projects
California red-legged frog habitat	acres	128	1
Giant reed control	acres	125	1
Nontidal Wetland: Freshwater Wetland Creation/Restoration component	acres	14	1
Nontidal Wetland: Stream and Watershed Protection component	acres	820 -1,080	1
Smooth Cordgrass control	acres	10	1
Marsh	acres	87	1
Nontidal Marsh	acres	0.5	1
Riparian	acres	90.54	10
River Bank	Linear Feet	1,720	1
Riparian/upland/wetland/waters mix	acres	1.65	4
Spawning gravels	acres	0.58	1
Shaded riverine aquatic cover	Linear Feet	41,563	3
Tidal Wetland[1]	acres	65.54	2
Trees	Number of Trees	128	3
Upland	acres	6	1
Wetland	acres	14.22	3

[1] Note that 30 acres of tidal wetlands also mitigated for Clapper Rail Habitat

Compensatory Mitigation Specifications

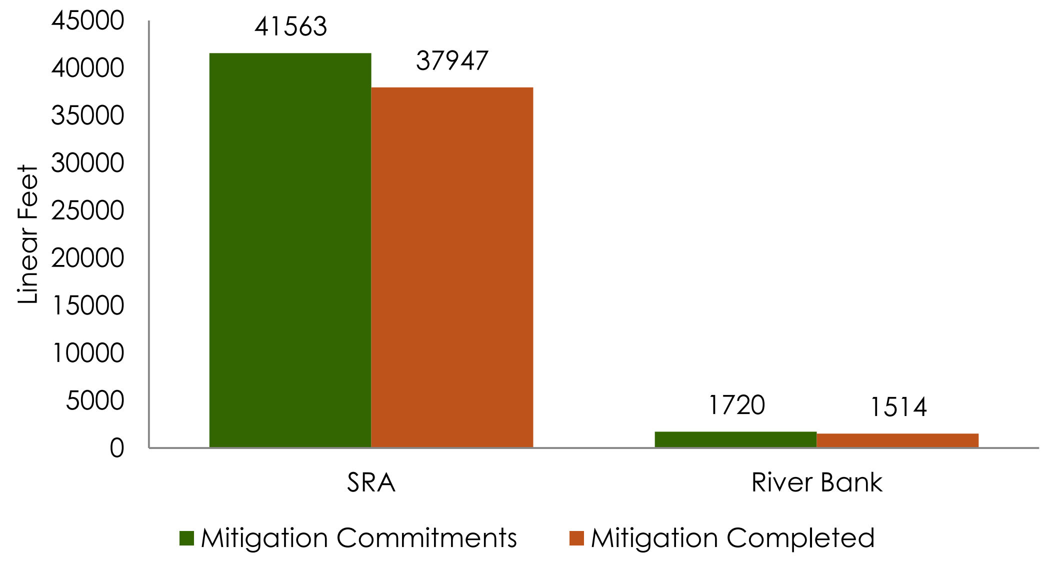
Compensatory mitigation for the SMP consisted of a combination of in-place habitat enhancement and acquisition of land and enhancement. The SMP has purchased compensatory mitigation land for the nontidal wetland: freshwater wetland creation/restoration mitigation component and the nontidal wetland: stream and watershed protection mitigation component. There are three mitigation sites purchased by the District that are still in the process of finalizing the mitigation. The regulatory agencies have agreed that the District will receive mitigation credit for these sites and once the long term management plans and the site's conservation easements are recorded by the regulatory agencies, the mitigation will be considered complete. The mitigation sites currently in the process of completing the long-term management plans and the conversation easements are Hendrys Creek (100 acres), Coyote Ridge (431.2 acres), and Kammerer (191.4 acres) (Santa Clara Valley Water District 2014). Watershed Projects have 241.6 acres of compensatory mitigation requirements and are deficient by 41.1 acres.

Figure B-1: Mitigation Commitments and Compliance Across Habitat Types for Watershed and Water Utility Projects



Note: The Upper Guadalupe River Project is its early stages of compensatory mitigation implementation. Low mitigation acquisition affects riparian and wetland mitigation compliance.

Figure B-2: Mitigation Commitments and Compliance for Shaded Riverine Aquatic Cover and Riverbank Habitats for Watershed and Water Utility Projects



Note: The Upper Guadalupe River Project is its early stages of compensatory mitigation implementation. Low mitigation acquisition affects SRA and river bank mitigation compliance.

Figure B-3: Tree Mitigation Commitments and Compliance for Watershed and Water Utility Projects

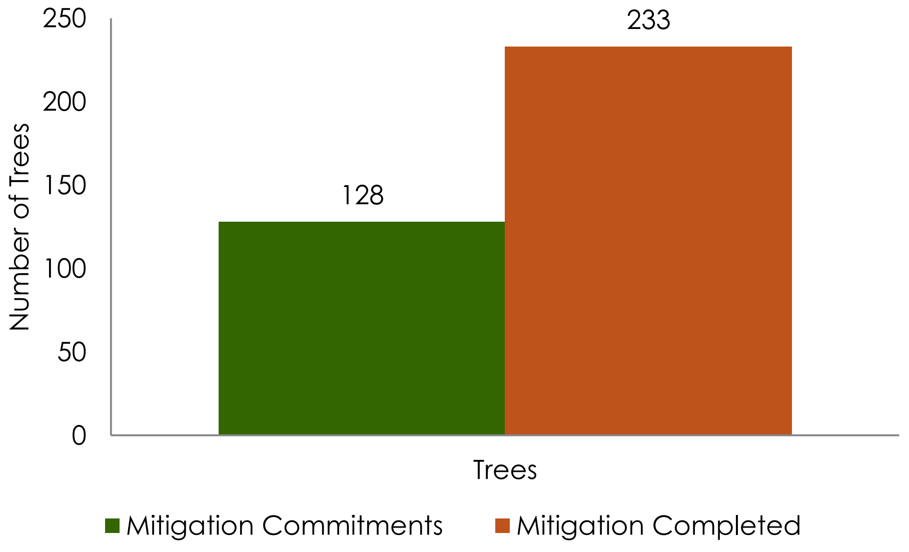
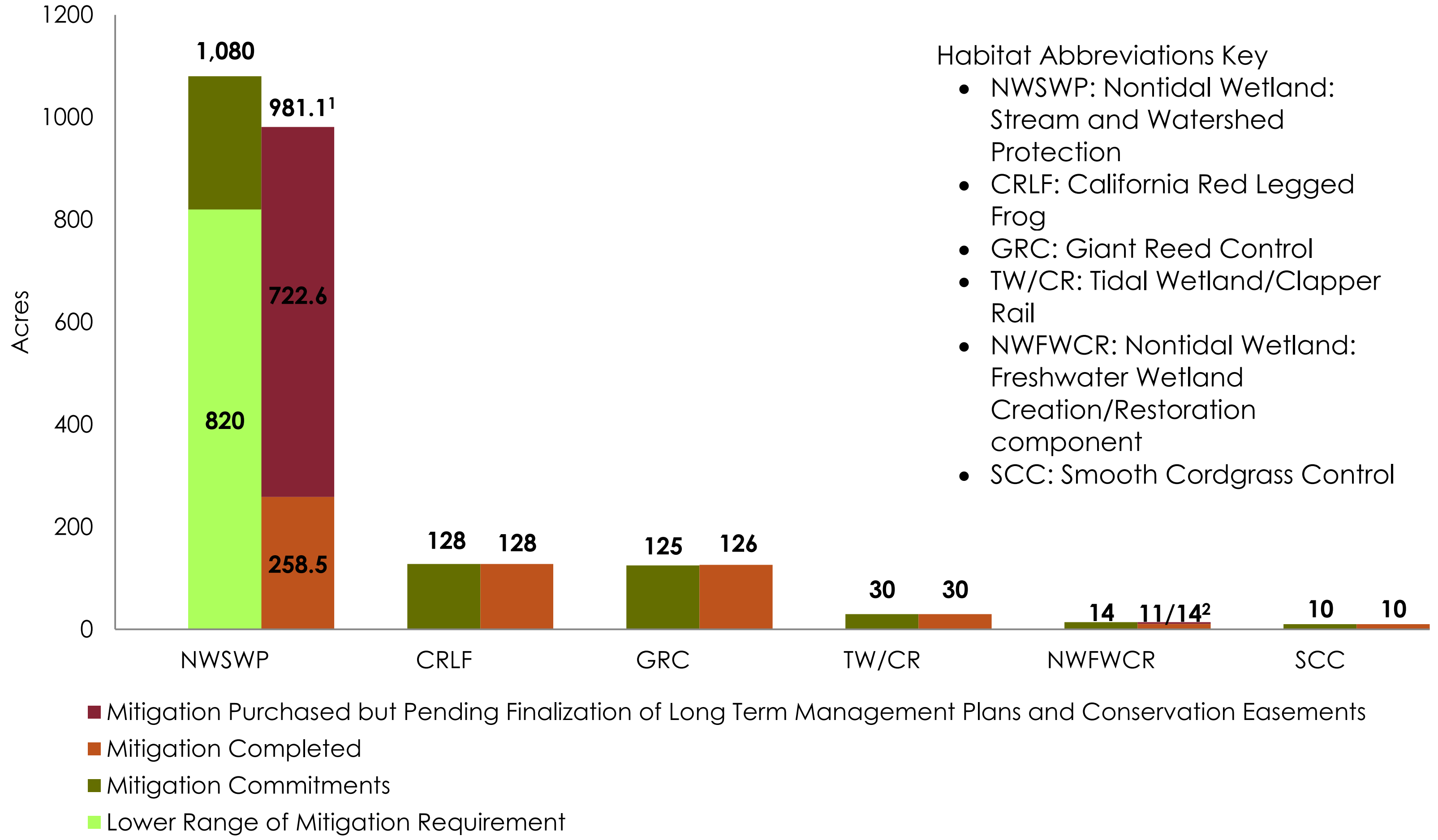


Figure B-4: SMP Mitigation Commitments and Compliance



Habitat Abbreviations Key

- NWSWP: Nontidal Wetland: Stream and Watershed Protection
- CRLF: California Red Legged Frog
- GRC: Giant Reed Control
- TW/CR: Tidal Wetland/Clapper Rail
- NWFWCR: Nontidal Wetland: Freshwater Wetland Creation/Restoration component
- SCC: Smooth Cordgrass Control

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[1] The District has purchased 981.5 acres for the stream and watershed protection mitigation component. The District has completed the long term management plans and conservation easements for 263 acres and is still in the process of finalizing the long term management plans and conversation easements for 722.6 acres.

[2] The Distrtict has finalized the long term management plan and conservation easement for 11 acres of the freshwater wetland creation mitigaiton component. The remaining required acres (three) will be provided by stream and watershed protection mitigation.

Compensatory mitigation for Watershed and Water Utility projects consisted primarily of on-site restoration and in-place habitat enhancement. Compensatory mitigation of riparian habitats for the Matadero Barron Creek Long Term Remediation Project occurred off-site at the East Bayshore Mitigation Site. Furthermore, compensatory mitigation of tidal wetland for the Lower Guadalupe River Project occurred off-site at the Island Ponds mitigation site.

Compensatory Mitigation Commitment Variability across Projects and Divisions

Variations in the compensatory mitigation obligations required in CEQA documents and in the permits of the different regulatory agencies were fairly commonplace. Table B-2 shows variations in commitments by CEQA document and permit.

Compensatory Mitigation Compliance

Summary

A summary of the District's compensatory mitigation compliance for the 20 habitat requirements is provided in Appendix F. The results of the compliance audit are shown in a series of figures where the results are summarized by the following topics:

- Mitigation Compliance by Habitat
- Mitigation Compliance by Division
- Mitigation Compliance by Project
- Monitoring Timeframes
- Variations in Agency Requirements
- Incomplete Mitigation

Compensatory Mitigation Requirements and Compliance by Habitat

Figure B-1 shows the District's compensatory mitigation compliance status summarized by habitat types, for Watershed and Water Utility projects where commitments are measured in acres. Figures B-2 presents the status of SRA and river bank mitigation compliance and Figure B-3 present the status of tree habitat mitigation compliance.

The SMP mitigation is presented separately in Figure B-4 because the SMP has a much larger overall mitigation commitment and the mitigation process differs from other Watershed and Water Utility projects.

There are six compensatory habitat mitigation requirements for watershed and water utility projects, which are not currently being met: tidal wetland, riparian, wetland, spawning gravels, SRA, and river bank. Two mitigation components for the SMP are still currently in the process of completing mitigation: nontidal wetland stream and watershed protection and nontidal wetland restoration. The District is in the process of finalizing the long term management plans and conservation easements for three sites that have been purchased by the District. The mitigation for these two components will be considered complete once the long term management plans and the conservation easements are finalized.

Table B-2: Variations in Mitigation Requirements (acres)

Project	Habitat or Species	CEQA (Draft)	CEQA (Final)	CDFW 1600 Central Coast	CDFW 1600 Bay Delta	USFWS Bio Opinion	NMFS Bio Opinion	ACOE404 Permit	SFRWQCB 401 Permit	CCRWQCB 401 Permit	ACOE Section 10 Permit	Other Documents
SMP	CRLF				108	108						128[1]
	Giant Reed Control	125	125	125	125	125		125	74	16.8		125[1]
	Nontidal Wetland: Stream and Watershed Protection component	920 to 1,210	820 to 1,080	820 to 1,080	820 to 1,080			820 to 1,080	820 to 1,080		820 to 1,080	820 to 1,080[1]
	Smooth Cordgrass Control			10	10			18.9			10	10[1]
Calabazas Creek Flood Project	Trees		35 Trees	74 Trees								
Guadalupe River Project (Downtown)	SRA		23,677 linear feet	22,836 linear feet					18,026 linear feet			
Lower Guadalupe River Flood Protection Project	Riparian	6.48		6.48			12.39[3]		6.48			
	Tidal Wetland	35.34		7.7			93.24[3]	12.15	35.54			35.54[2]

Table B-2 (*Continued*): Variations in Mitigation Requirements (acres)

Project	Habitat or Species	CEQA (Draft)	CEQA (Final)	CDFW 1600 Central Coast	CDFW 1600 Bay Delta	USFWS Bio Opinion	NMFS Bio Opinion	ACOE404 Permit	SFRWQCB 401 Permit	CCRWQCB 401 Permit	ACOE Section 10 Permit	Other Documents
Lower Silver Creek Flood Protection and Creek Restoration Project	Wetland		12.7					11.6	12.7			
Reconstruction of Bollinger Bridge over Calabazas Creek	Riparian, Upland, Jurisdictional Waters		0.24					0.21				

Note: Blank cells under the CEQA (Draft) or the CEQA (Final) indicate that the document was not available. Blank cells under the permit columns indicate that the permit was not obtained.

[1] Data from the 2013-2024 Stream Maintenance Manual

[2] Data from the Island Ponds Mitigation Monitoring Report Year 7

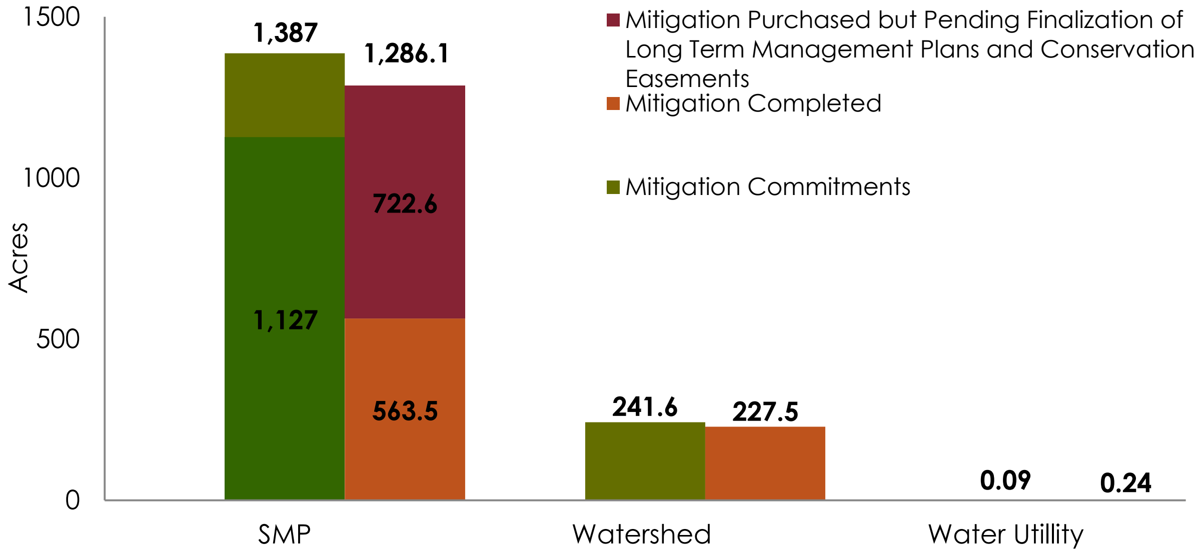
[3] The NMFS BO for the Lower Guadalupe River Project has ambiguous language about mitigation. The BO references the MMRP but also describes mitigation for impacts in the description of proposed action section. The impacts described in the description of proposed action section are larger than those in the MMRP and correspond to larger mitigation. These impact areas are likely from old calculations and the mitigation referenced in the MMRP is used for the audit analysis.

Compensatory Mitigation by Division

The District is organized into two divisions: Watersheds and Water Utility. Each Division has a staff of environmental planners who prepare CEQA documents and obtain permits.

Figure B-5 presents a summary of total mitigation commitments and mitigation completed for the Watershed and Water Utility Divisions. For the purposes of analysis, the Watershed Division was divided into two components: the SMP project and the Watershed projects. Total mitigation commitments include all habitat and species requirements measured in acres. The SMP has the highest compensatory mitigation requirements at 1,127 to 1,387 acres and is currently in the process of completing mitigation obligations. The District has purchased compensation lands that are pending agency acceptance of long term management plans and conservation easements. The District will complete its SMP mitigation when the long term management plans and conversation easements for the three purchased sites are recorded by regulatory agencies. Watershed projects are required to mitigate for a total of 241.6 acres. Watershed projects are currently behind in their mitigation obligations. This is primarily due to the Upper Guadalupe River Project, which is just beginning to mitigate impacted areas. Water Utility projects have low compensatory mitigation requirements (under 1 acre), which are currently being met.

Figure B-5: Mitigation Commitments and Compliance Across District Divisions



Note: The Upper Guadalupe River Project is its early stages of compensatory mitigation implementation. Mitigation habitats are currently being established by the Army Corps of Engineers.

Compensatory Mitigation by Project

Figure B-6 illustrates the total mitigation commitments at the project level. The SMP mitigation commitments and mitigation completed is shown in Figure B-4. Note that Lower Coyote Creek Reach 2 and 3 are combined in Figure B-6 because data about mitigation completed was not differentiated between the reaches. Four of the 21 projects have compensatory mitigation requirements that are not currently being met: the SMP, Lower Guadalupe River Flood Control Project, Downtown Guadalupe River Flood Control Project, and Upper Guadalupe River Flood Control Project.

Incomplete Mitigation

Compensatory mitigation has not been fully completed for the SMP, Lower Guadalupe River Flood Control Project, Downtown Guadalupe River Flood Control Project, and Upper Guadalupe River Flood Control Project (see Table B-3). The District is in the process of completing mitigation for these projects.

Four of the mitigation requirements could not be quantified and are therefore not demonstrated in Figures B-1 – B-4. Quantifiable information for bank planting, large woody debris, minor work activities, and vegetation compensatory mitigation requirements for the SMP were not available.

Compensatory Mitigation Monitoring Time Frames

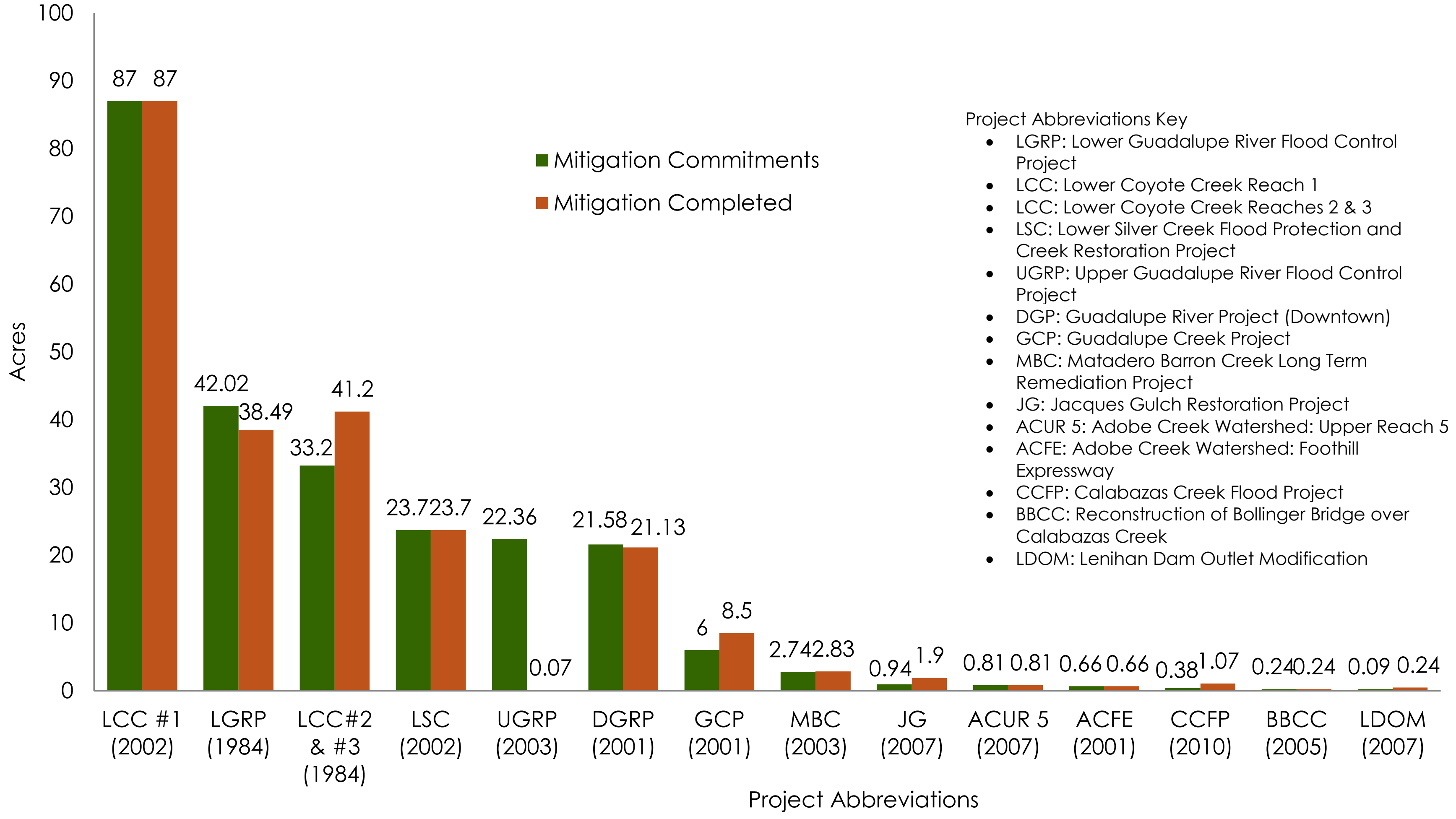
Monitoring Timeframes

Figure B-7 shows the agency-specified monitoring timeframes for the 21 projects that were reviewed in this audit. 33 percent of the projects (7 out of 21 projects) have a monitoring time frame of 100 years, which applies to 13% of the acres monitored (212.16 acres monitored of the total 1,628.84 acres monitored). The 100 year monitoring requirement applies primarily to compensation mitigation for tidal wetland, marsh, riparian, and spawning gravels.

Variations in Monitoring Time Frames

There are two instances where the regulatory agencies have required different monitoring timeframes for the same impact: for bank planting and giant reed control (see Table B-4). USFWS and SFRWQCB have twice the monitoring time frame requirements of the Central Coast and Bay Delta RWQCB and CDFW for two compensatory mitigation requirements of the SMP. The monitoring timeframes were consistent across agencies for the Water Utility and Watershed projects.

Figure B-6: Mitigation Commitments and Compliance Across District Projects



Project Abbreviations Key

- LGRP: Lower Guadalupe River Flood Control Project
- LCC: Lower Coyote Creek Reach 1
- LCC: Lower Coyote Creek Reaches 2 & 3
- LSC: Lower Silver Creek Flood Protection and Creek Restoration Project
- UGRP: Upper Guadalupe River Flood Control Project
- DGP: Guadalupe River Project (Downtown)
- GCP: Guadalupe Creek Project
- MBC: Matadero Barron Creek Long Term Remediation Project
- JG: Jacques Gulch Restoration Project
- ACUR 5: Adobe Creek Watershed: Upper Reach 5
- ACFE: Adobe Creek Watershed: Foothill Expressway
- CCFP: Calabazas Creek Flood Project
- BBCC: Reconstruction of Bollinger Bridge over Calabazas Creek
- LDOM: Lenihan Dam Outlet Modification

Note: The year in the parentheses indicates the earliest year when a permit was obtained for the project. Mitigation for Lower Coyote Creek Reach #2 and Reach #3 are combined because the acreage of mitigation completed was not differentiated between reaches in the agency sign-off letter that verified mitigation completion.

Table B-3: Incomplete Compensatory Mitigation Compliance by Project, Division, and Habitat						
Project	**Division**	**Habitat/Species**	**Mitigation Commitments (acres)**	**Mitigation Completed (acres)**	**Mitigation Deficit (acres)**	**Reasons for Incomplete Compensatory Mitigation**
SMP	Watershed	Nontidal wetland: freshwater wetland creation/restoration component	14	11/14	0	The missing three acres will be provided by mitigation from the stream and watershed protection mitigation. This mitigation will be considered complete when the long term management plans and conservation easements are recorded by the regulatory agencies.
		Nontidal wetland: stream and watershed protection component	820-1,080	258.5/981.1	0	The District has purchased a total of 981.1 acres to complete the stream and watershed protection mitigation component. 258.5 acres belong to three sites (Carnadero Preserve, Stevens Canyon Ranch, and Moore Property) that have fully completed the mitigation process. 722.6 acres belong to three sites (Hendrys Creek, Coyote Ridge, Kammerer) that are still in the process of completing the mitigation and finalizing the long term management plans and conservation easements with the regulatory agencies.
Guadalupe River Project (Downtown)	Watershed	Spawning Gravels	0.58	0.13	0.45	Spawning gravels change every year. The District has met this requirement in past monitoring years; however it did not meet this requirement in Water Year 2012. A total of 0.13 acres of spawning gravels was identified during Water Year 2012; however, this was only for two sites. There was another site with spawning gravels, which was not monitored that year. The District may in fact be compliant; however, we could not verify.
Lower Guadalupe River Flood Protection Project	Watershed	Riparian	6.48	6.14	0.34	The District has not completed mitigation for riparian habitat. The District is still monitoring restoration at these sites and will continue to monitor until the mitigation obligation is completed.
		Tidal Wetland	35.54	32.25	3.29	The District is in the process of completing its mitigation. The Island Ponds tidal wetlands mitigation site is in its seventh year of monitoring. It is expected that in the following years there will be more acres of native salt marsh vegetation, which will meet the mitigation obligations.

Table B-3 (*Continued*): Incomplete Compensatory Mitigation Compliance by Project, Division, and Habitat

Project	Division	Habitat/Species	Mitigation Commitments (acres)	Mitigation Completed (acres)	Mitigation Deficit (acres)	Reasons for Incomplete Compensatory Mitigation
Upper Guadalupe River Project	Watershed	Freshwater Wetland	1.47	N/A	1.47	The District is in its early stages of compensatory mitigation implementation. Mitigation habitats are currently being established by the Army Corps of Engineers.
		Riparian	20.89	0.7	20.19	The District is in its early stages of compensatory mitigation implementation. Mitigation habitats are currently being established by the Army Corps of Engineers.
		SRA	4,866 linear feet	1,162 linear feet	3,704 linear feet	The District is in its early stages of compensatory mitigation implementation. Mitigation habitats are currently being established by the Army Corps of Engineers.
		River Bank	1,720 linear feet	1,514 linear feet	206 linear feet	The District is in its early stages of compensatory mitigation implementation. Mitigation habitats are currently being established by the Army Corps of Engineers.

Figure B-7: Monitoring Time Frames for Compensatory Mitigation (by project)

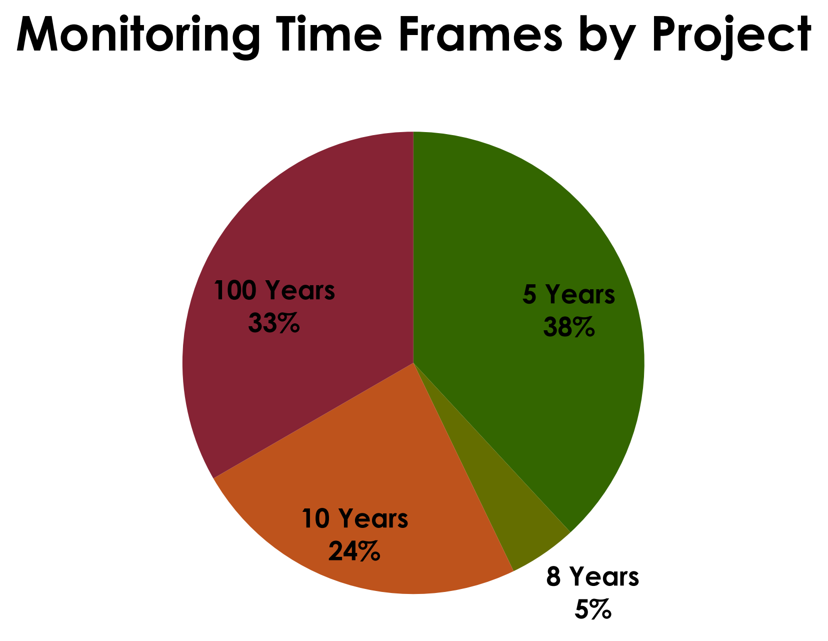


Table B-4 Monitoring Time Frame Variations

Project Name	Habitat	Time Frame (Years)				
		USFWS	1600 Central Coast	1600 Bay Delta	CCRWQCB 401 permit	SFRWQCB 401 permit
SMP	Bank Planting	10	5	5		
SMP	Giant Reed Control	10			5	10

STAFF INTERVIEW RESULTS

Panorama identified a total of 211 separate comments from District staff in 20 interviews. Of the 233 comments, 219 comments represented District data gaps or recommendations for the compensatory mitigation program. The 219 comments from the staff interviews were divided into eleven categories. Descriptions of the categories are shown in Table B-5. The breakdown of the comments by category is displayed in Figure B-8. More than half of all comments fell into the following four categories:

- Defining mitigation and monitoring protocol
- District internal communication and structure
- Compensatory mitigation reporting and tracking
- Project management standardization

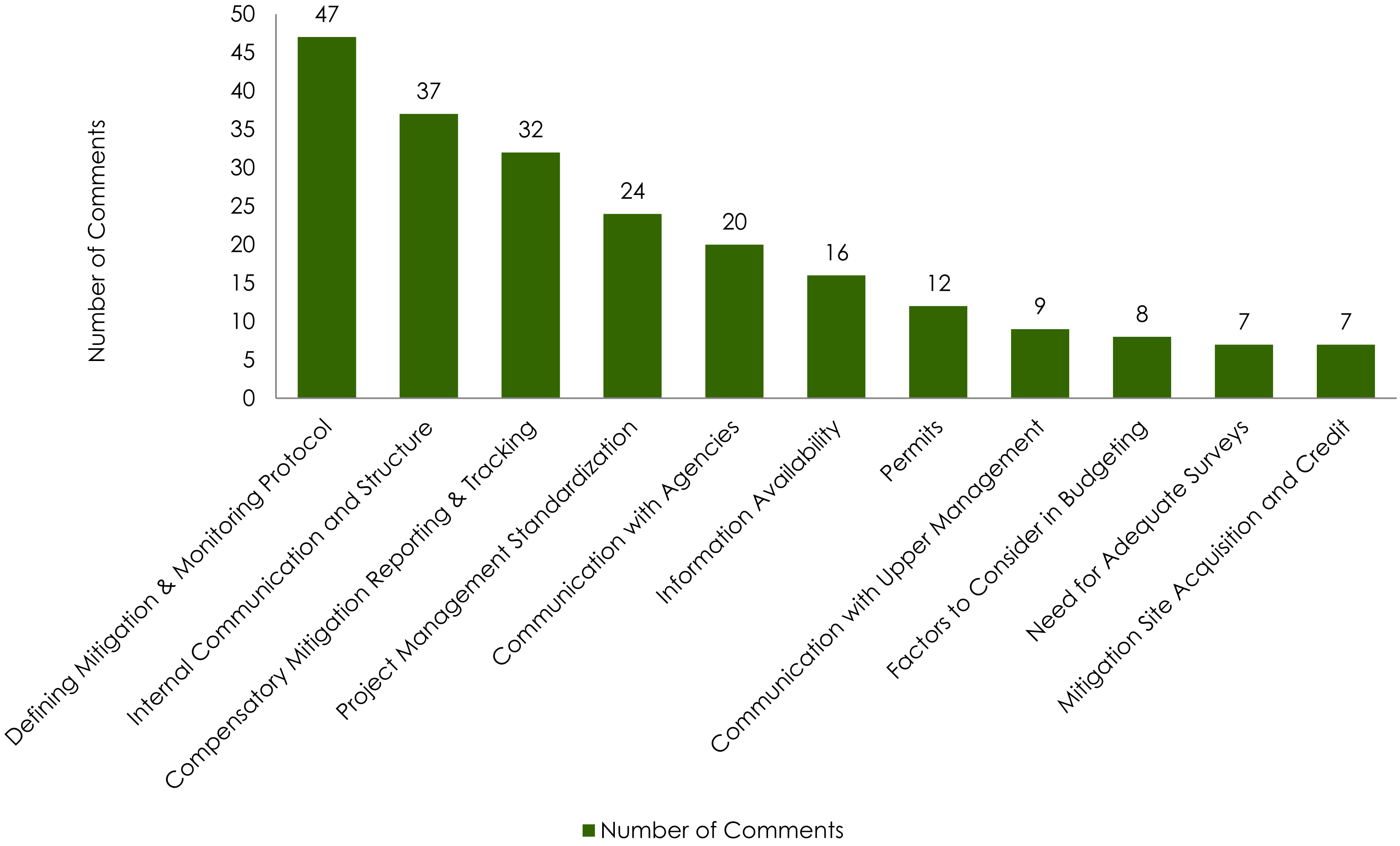
Table B-5: Summary of Staff Interview Comments

Category	Description/Comment Summary
Areas of Success	
Effective Mitigation Procedures	• Environmental Planners that drive the project are effective at getting the mitigation requirements in the construction specifications • The HCP will be effective • Definite success criteria in the 2014-2023 SMP will be effective • Well written permits and conditions are effective for meeting compensatory mitigation requirements • Adaptive management has been effective
Tracking Databases	• Permit tracking database is effective • The EMAP database is effective • EMISM (Ecological Monitoring Information Management System) is an effective spreadsheet for tracking mitigation
Project construction	• Effective at constructing projects • Positive public perception
Areas for Improvement	
Defining Mitigation	• Lack of, or need for, standardized mitigation criteria • Variations in mitigation requirements between CEQA and regulatory permits • Lack of or limited negotiation on permit conditions • Acceptance of inappropriate mitigation in permit conditions
Compensatory Mitigation Reporting & Tracking	• Inefficiency in compensatory mitigation tracking or monitoring • Reporting delays • Over-estimation of impact areas and compensatory mitigation requirements due to lack of monitoring and tracking
Need for adequate surveys	• Need for better surveys, including creek surveys, cultural surveys, and surveys for species presence • Need for CEQA-driven surveys
Mitigation Site Acquisition and Credit	• Inadequate crediting for purchased land • Need for mitigation banking • Difficulty in negotiating and getting agencies to agree on long-term management
Communication with Agencies	• Need to contact regulatory agencies early in the process • Need for negotiation with regulatory agencies on mitigation requirements • Need for the District to speak with a unified voice when negotiating/renegotiating permit requirements
Permits	• Inconsistent agency mitigation requirements • Lack of internal guidelines for the permitting process

Table B-5 (*Continued*): Summary of Staff Interview Comments

Category	Description/Comment Summary
Project Management and Performance Standards	• No standard process for project close-out • Lack of mitigation performance standards or mitigation goals
Information Availability	• Need for information sharing • Need to learn from past mitigation projects • Need for training/development
Internal Communication and Structure	• Inadequate information sharing across Divisions • Lack of monitoring and maintenance staff involvement in project planning • Lack of planner involvement in mitigation implementation or monitoring • Need for planners to track mitigation compliance • Lack of communication about schedules between planners and engineers
Communication with Upper Management	• Lack of a set process for reporting to management • Lack of management sign-off on regulatory permits and management not being informed when permit conditions vary from CEQA mitigation measures
Factors to Consider in Budgeting	• Long-term costs of mitigation monitoring during project planning • Need to prioritize projects and reduce efforts when budgets are cut

Figure B-8: Categorized Staff interview Comments and Recommendations



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APPENDIX C

Findings from the Benchmarking Review

APPENDIX C: FINDINGS FROM THE BENCHMARKING REVIEW

SUMMARY OF BENCHMARK AGENCY MITIGATION

Overview of Benchmark Mitigation

The review of benchmark agency environmental documents and permits showed a disparity in compensatory mitigation. Habitat improvement, land acquisition, and tree replacement were common mitigation measures, although not all projects had the same types of mitigation.

Table C-1 presents a summary of the benchmark agency compensatory mitigation ratios for habitat improvement. Mitigation for habitat improvement is generally required at a ratio between 1:1 and 3:1 with some exceptions of lower and higher mitigation ratios, including 0.6:1, 0.84:1, and 4.3:1. Mitigation for temporary impacts were generally mitigated at a 1:1 ratio and mitigation for permanent impacts were generally mitigated at a higher ratio (2:1, 3:1, and 4.3:1).

The mitigation ratios for tree removal ranged from 1:1 to 10:1, depending on the kind of tree that was removed. The highest mitigation ratio (10:1) was for the replacement of oak trees. Two benchmarking projects, from EBMUD and SFPUC, required land-acquisition mitigation. The mitigation ratios for land-acquisition mitigation are 1.8:1 and 14:1 and higher than other mitigation ratios. The 1.8:1 ratio is for re-inundation from dam replacement. A lower mitigation ratio reflected that the area was previously inundated by the dam and was habitat for a short period.

Sonoma County Water Agency (SCWA)

Projects

The SCWA provided two projects to review that included compensatory mitigation:

- Stream Maintenance Program
- Matanzas Creek Detention Reservoir Sediment Removal Project

Mitigation Requirements

SMP

SCWA is largely compensating for SMP impacts in modified and unmodified channels at a 1.1:1 mitigation ratio. The exceptions to 1.1:1 compensation are:

1. Impacts to native and non-native trees are mitigated at a 2:1 and 1.5:1 mitigation ratio, respectively.
2. The ratio of 1.1:1 increases to 2:1 in when the mitigation performance does not meet the required performance criteria.

Table C-1: Summary of Benchmark Agency Mitigation Ratios

District	Mitigation Ratio Range for Habitat Improvement		Mitigation Ratio for Land Acquisition	Mitigation Ratio for Tree Replacement
	Low	High		
SCWA	0.6:1	2:1	N/A	Oak trees 10:1 Native trees 2:1 Non-native trees1.5:1 Non-native trees1:1
SFPUC	1:1	4.3:1	1.8:1	N/A
CCCO	0.84:1	3:1	N/A	Native trees 3:1
CCWA	1:1	3:1	N/A	N/A
EBMUD	N/A	N/A	14:1	N/A
MMWD	1:1	1:1	N/A	Native trees 3:1

SCWA: Sonoma County Water Agency
CCWA: Contra Costa Water Agency
CCCO: Contra Costa County Department of Public Works
EMBUD: East Bay Municipal Utility District
MMWD: Marin Municipal Water District

Mitigation activity for the SCWA SMP is divided into three tiers:

- **Tier 1 (on-site):** Mitigation is implemented on-site where the maintenance activity was conducted. The mitigation work includes enhancement and restoration of the stream and aquatic functions and resources impacted by the maintenance activities. Tier 1 mitigation is completed at a 1:1 ratio.
- **Tier 2 (off-site):** Mitigation is implemented off-site at other stream channels. Tier 2 mitigation will not necessarily be implemented for every maintenance activity but may be used when there are no suitable opportunities for enhancement or restorations on-site. Like Tier 1, Tier 2 mitigation is completed at a 1:1 ratio
- **Tier 3 (off-site partnership):** Mitigation is implemented off-site through a Watershed Partnership Program, whereby SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools, and/or Resource Conservation Districts. SCWA contributes 10% of the annual cost of implementing SMP sediment removal and bank stabilization projects to fund projects that provide water quality, habitat, and ecosystem benefits. Tier 3 mitigation addresses the temporary loss of beneficial uses and ecological functions and values that occur during the time gap between SMP maintenance activities and when Tier 1 mitigation has become fully functional. Tier 3 mitigation is completed at a 0.1:1 ratio and accounts for the 0.1 in the 1.1:1 mitigation ratio. Tier 3 mitigation is always completed in combination with Tier 1 and/or Tier 2 mitigation.

Matanzas Creek Detention Reservoir Sediment Removal Project

Table C-2 shows the mitigation for the SCWA Matanzas Creek project.

San Francisco Public Utilities Commission (SFPUC)

Projects

The SFPUC provided three projects to review for compensatory mitigation:

- Calaveras Dam Replacement
- Pipeline Seismic Upgrade Project
- San Antonio Backup Pipeline

Mitigation Requirements

Mitigation requirements for the SFPUC Calaveras Dam Replacement Project vary between the CDFW, RWQCB, and USFWS permits. Table C-3 provides a summary of the Calaveras Dam Replacement Project mitigation. The mitigation requirements in the agency permits are generally consistent at 1.1:1 for temporary impacts and 3:1 for permanent impacts, with the exception of USFWS mitigation which is applied at a 1.8:1 ratio. USFWS permit also includes a much larger range of impacts with a corresponding larger total mitigation requirement. Mitigation for smaller SFPUC pipeline projects is shown in Table C-4. Temporary impacts were mitigated at a 1:1 ratio on both small projects. Permanent impacts were mitigated at a relatively high ratio of 4.3:1.

Table C-2: SCWA Sediment Removal Mitigation

Project	Habitat	Mitigation Ratio
Matanzas Creek Detention Reservoir Sediment Removal Project	Temporary impacts to riparian habitat	1:1
	Permanent impacts to riparian habitat	0.6:1
	Temporary impacts to seasonal wetland	1.56:1
	Non-native trees	1:1
	Coastal Oak trees	10:1

Table C-3: Mitigation for the Calaveras Dam Replacement Project

Agency	Habitat	Impacts (Acres)		Mitigation Ratio	Mitigation Required (Acres)
		Temporary	Permanent		
CDFW	Perennial, intermittent, and ephemeral creek channel	0.1 1,281 linear feet	0.55 4,593 linear feet	1.1:1[1] 3:1	1.76 15,158 linear feet
	Seasonal Wetland	0.06	0.07	1.1:1[1] 3:1	2.76

Table C-3 (*Continued*): Mitigation for the Calaveras Dam Replacement Project

Agency	Habitat	Impacts (Acres)		Mitigation Ratio	Mitigation Required (Acres)
CDFW	Freshwater Marsh	No Temporary Impact	1.04	3:1	3.12
	Riparian (coastal live oak, willow, central coast oak)	0.34	2.24	1.1:1[1] 3:1	6.72
SFRWQCB	Wetland, stream, riparian, and open water habitat	16.57	20.29	3:1	112
USFWS	Wetland, waters, and upland habitat	300	350	1.8:1	1,151.49

[1] The 1.1:1 ratio applies to temporary impacts and the 3:1 ratio applies to permanent impacts

[2] Approximately 300 acres are affected during construction and approximately 350 acres are affected due to the re-inundation of the reservoir once the dam is replaced

Table C-4: SFPUC Mitigation

Project	Habitat	Mitigation Ratio
Pipeline Seismic Upgrade Project	Temporary impacts to waters of the state	1:1
San Antonio Backup Pipeline	Temporary impacts to creek and riparian habitat	1:1
	Permanent impacts to creek and riparian habitat	4.3:1

Contra Costa County Department of Public Works (CCCO)

Projects

The Contra Costa County projects addressed in the benchmark analysis are:

- Fernandez Ranch Public Access and Creek Restoration
- Norris Canyon Estate San Catanio Creek Tributary Stabilization

Mitigation

Contra Costa County has compensatory mitigation for several types of impacts, as shown in Table C-5.

Table C -5: CCCO Mitigation

Project	Habitat	Mitigation Ratio
The Fernandez Ranch Public Access and Creek Restoration Project	Temporary impacts to riparian wetland	0.9:1
	Permanent impacts to seasonal wetlands	2:1
Norris Canyon Estate San Catanio Creek Tributary Stabilization Project	Native trees	3:1
	Permanent impacts to waters below the ordinary high water mark	0.84:1

Contra Costa Water Authority (CCWA)

Projects

The Contract Costa Water Agency projects addressed in the benchmark analysis are:

- Alternative Intake
- Los Vaqueros Reservoir Expansion

Mitigation Requirements

Three mitigation ratios were identified for two CCWA projects as shown in Table C-6.

Table C-6: CCWA Mitigation

Project	Habitat	Mitigation Ratio
Alternative Intake Project	Permanent Impacts to waters	3:1
Los Vaqueros Reservoir Expansion Project	Native trees	3:1
	Temporary impacts to vegetation	1:1

East Bay Municipal Utility District (EBMUD)

EBMUD has few projects that require compensatory mitigation. The San Pablo Dam Seismic Upgrade Project was the only EMBUD project identified in the benchmarking review. EBMUD is compensating for impacts to CRLF and Alameda Whipsnake with land-acquisition mitigation. EBMUD mitigation for 2 acres of permanent impact and 0.62 acres of temporary impact to CRLF and Alameda Whipsnake habitat was accomplished through acquiring a parcel of 37 acres. The land-acquisition mitigation ratio is 14:1.

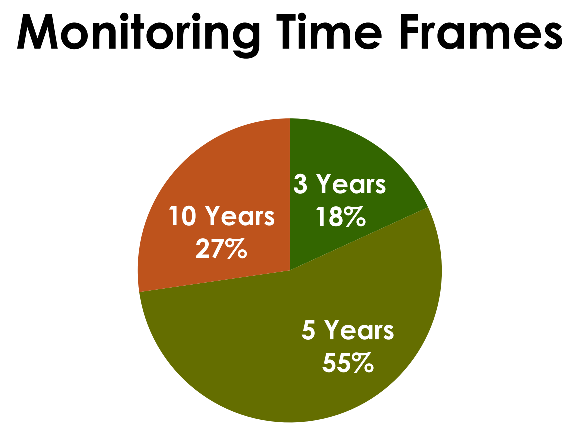
Marin Municipal Water District (MMWD)

The MMWD has few projects that require compensatory mitigation. Two MMWD projects had mitigation. The mitigation ratios were consistent between the two projects. The MMWD was required to mitigate temporary impacts to waters at a 1:1 ratio and native trees at a 3:1 ratio.

Monitoring Time Frames

The Benchmarking Review found that more than half of the benchmarking projects (55 percent, 6 out of 11 projects) had a monitoring time frame of five years. There were 3 out of 11 projects (27 percent) that had a monitoring time frame of 10 years and 2 out of 11 projects (18 percent) that had a monitoring time frame of 3 years. Note that the monitoring time frames for the CCWA Alternative Intake Project and the SFPUC San Antonio Backup Pipeline Project were not obtained. Figure C-1 shows the mitigation time frames for benchmarking agencies (when available).

Figure C-1: Mitigation Time Frames for Benchmarking Agencies



SUMMARY OF DISTRICT MITIGATION

The District mitigation obligations are described in *Report of Preliminary Findings* (Panorama 2014). A summary of the obligations is provided here to show the mitigation that is used in the benchmarking analysis.

Mitigation Ratios

Habitat improvement, land acquisition, and tree replacement are mitigation measures that were most consistently required across District and Benchmarking agencies. Land acquisition was not required for Watershed or Water Utility projects, but onsite habitat improvement was required for all District projects analyzed. Land acquisition was a required mitigation for SMP1 and is a type of mitigation in SMP2.

The mitigation ratios are a consistent means to compare District mitigation against benchmarking agency mitigation for similar habitats and impacts. District mitigation ratios are summarized in Table C-7. The District mitigation ratios by habitat type and by project are summarized in Appendix F.

SMP1 required more acres of mitigation than any other District project or program. The stream and watershed protection component of SMP1 required mitigation for impacts to freshwater wetlands at 10:1 and 15:1 ratios. The District was required to acquire a total of 820 to 1,080[1] acres of freshwater wetland habitat for the stream and watershed protection component of the SMP1.This mitigation is unlike other District projects because SMP1 requires land acquisition, rather than habitat improvement or enhancement.

Table C-7: Summary of District Mitigation Ratios

District Project	Mitigation Ratio Range for Onsite Habitat Improvement		Mitigation Ratio for Land Acquisition	Mitigation Ratio for Tree Replacement
	Low	High		
SMP 1	0.33:1	3:1	10:1[1] 15:1	Non-native trees 1:1 Native trees 3:1
SMP 2	1:1	4:1	2:1 3:1 4:1	1:1[2] 1.1:1 1.3:1 1.5:1 2:1 3:1
Watershed and Water Utility projects	1:1	4:1	N/A	Non-native trees 1:1 Non- native trees 2:1 Native trees 3:1 Oak trees 10:1

N/A= Not applicable because there are no land acquisition mitigation measures in the projects reviewed

[1] The 10:1 ratio applies to lands adjacent to stream resources up to 50 feet from the centerline of first order streams and 150 feet from the centerline of second order and great streams. The 15:1 ratio applies to lands from 150 up to 500 feet from the centerline of second order and greater streams. Both of these areas are considered freshwater wetlands.[2] Mitigation ratios depend on the size of the tree or shrub that was removed and the type of channel where the maintenance activity took place. Refer to Table F-1 in Appendix F.

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[1] The mitigation is in the form of a range due to the application of the mitigation ratios. The District receives credit for the land that they acquire at a 10:1 ratio or at a 15:1 ratio, based on the kind of land that is acquired. The District can either mitigate 820 acres of land that is mitigated at a 10:1 ratio, 1,080 acres of land that is mitigated at a 15:1 ratio, or a mix of land at a 10:1 ratio and 15:1 with an acreage that falls within the 820 to 1,080 range.

The SMP2 has mitigation ratios that range from 1:1 to 4:1. Refer to Table F-1 Appendix F for further detail on the SMP2 mitigation ratios. The SMP2 mitigation ratio depends on the following:

- The type of channel:
  - Modified channel
  - Modified channel with ecological value
  - Unmodified channel
- The maintenance activity:
  - Sediment removal
  - Vegetation management
  - Bank stabilization
- The mitigation type:
  - Invasive plant management program
  - Riparian restoration and planting program
  - Individual tree and shrub planting for trees with a diameter less than 6 inches
  - Individual tree and shrub planting for trees with a diameter between 6 and 12 inches
  - Instream complexity
  - Large woody debris replacement
  - Land acquisition- mitigation
- If the mitigation is land acquisition, there are two factors that will determine the ratio:
  - The nature of the mitigation:
    - Preservation: the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources.
    - Enhancement: the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s).
    - Restoration: the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource.
    - Establishment: the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site
  - In-kind or out-of-kind mitigation
- Bank Stabilization mitigation depends on:
  - Permanent or temporary impact
  - The type of material used for bank stabilization
    - Soft
    - Hybrid
    - Hard
  - Whether there is existing vegetation in the bank

- Mitigation ratios for land acquisition mitigation are increased by multipliers depending on the nature of the mitigation: preservation, enhancement, restoration, or establishment (Refer to Table F-1 in Appendix F).

Mitigation for the District Watershed and Water Utility projects ranges from 1:1 to 4:1 and largely depends on whether the project impact is temporary or permanent. Temporary impacts are mitigated at a 1:1 ratio and permanent impacts are mitigated at higher ratios (2:1, 3:1, and 4:1).

Monitoring Time Frames

The analysis of District monitoring timeframes found that 7 out of 21 District projects evaluated have a monitoring time frame of 100 years. The second most frequent monitoring timeframe is 10 years.

BENCHMARKING REVIEW

Benchmarking Across District Projects

This section provides a comparison of District mitigation across projects and Divisions.

Limitations

Five District Water Utility projects were identified in the benchmarking review:

- Almaden Reservoir/ Dam Maintenance Project
- Anderson Dam/Dam Maintenance Project
- Stevens Creek Reservoir / Dam Maintenance Project
- Uvas Dam and Chesbro Dam/ Dam Maintenance Project
- Vasona Reservoir/ Dam Maintenance Project

These five projects have less than one acre of mitigation, which makes comparison with other District divisions difficult. Figure C-2 shows Water Utility mitigation ratios along with mitigation ratios for Watershed Projects and the SMP1.

To provide a meaningful comparison of the District's internal mitigation requirements, mitigation for the SMP1 is evaluated relative to SMP2. Mitigation for the SMP1 is also compared with the Watershed projects.

SMP1 and SMP2

The SMP1 and the SMP2 have substantially different mitigation ratios. SMP1 mitigation ratios included land acquisition at a 10:1 and 15:1 ratio while SMP2 ratios for land acquisition ranged from 1:1 to 4:1. There are various parameters that determine the mitigation ratio for the SMP2, including the kind of channels where the impact takes place, the maintenance activity, and the mitigation type. There are far more parameters for mitigation in the SMP2 than the SMP1.

The approach to mitigation has changed in the SMP2. Rather than providing the mitigation upfront, as was done with the SMP1, mitigation is matched with the project impact. The SMP2 has a set of new problems. The District must attain agency approval for project mitigation in a way that is similar to obtaining individual permits. One of the purposes of the SMP is to have a program, which clearly defines mitigation procedures and makes obtaining permits unnecessary. This objective is not being met.

SMP and Watershed Projects

Land-Acquisition Mitigation

The greatest difference between the mitigation for SMP1 and the Watershed projects is the use of land-acquisition as mitigation. The land-acquisition component of the SMP1 mitigation is the largest component of the District's mitigation program based on the total acreage required. The mitigation requires the creation of 820-1,080 acres of freshwater wetland at a 10:1 and 15:1 ratio. No other District project has this level of mitigation and the total acreage of mitigation for all other projects is substantially less due to the lower mitigation ratios for habitat enhancement.

Habitat Improvement Mitigation

Figure C-2 provides a summary of the mitigation ratios for the SMP1 and Watershed projects. Note that the SMP1 is mitigating for more impacts than all of the other divisions.

Watershed projects combined. The Watershed projects are generally mitigating at higher ratios than the SMP1. The majority of SMP1 habitat mitigation is occurring at a 1:1 ratio, while the most frequent mitigation ratios for the Watershed projects is 1.4:1 and 2:1.

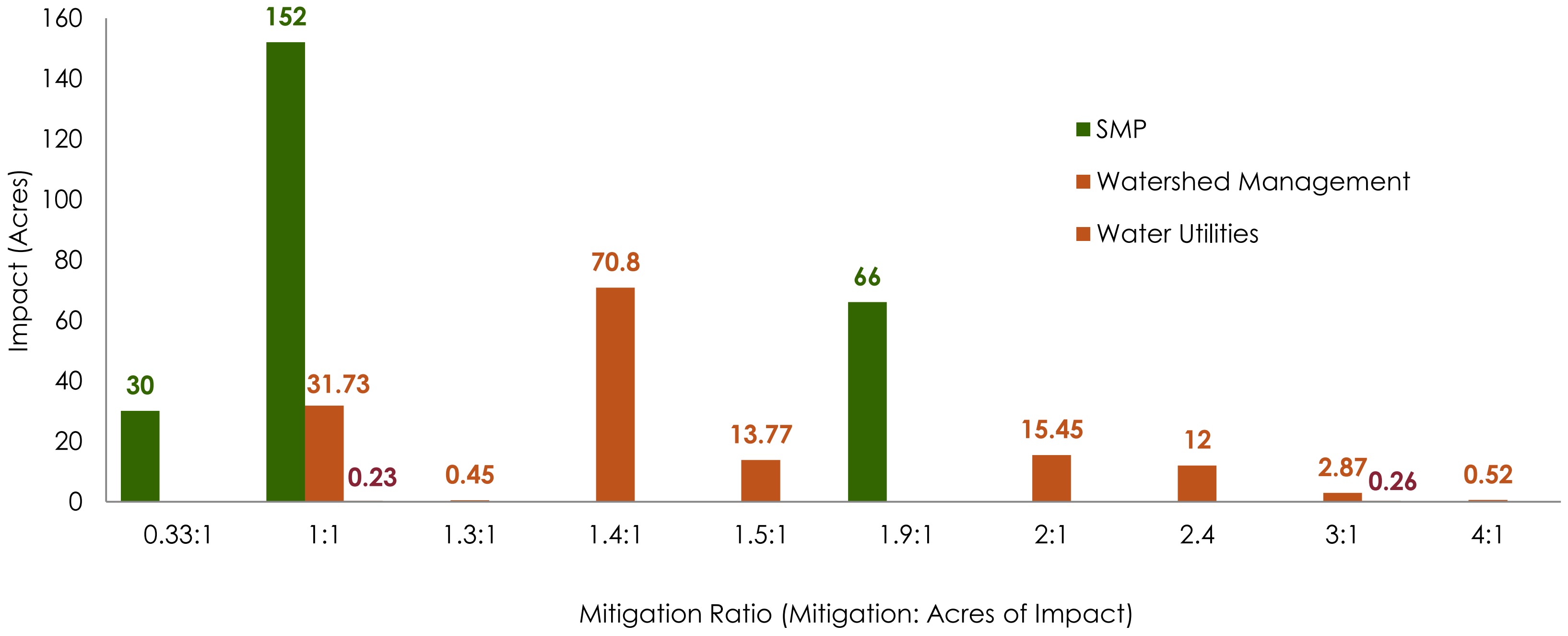
SMP Benchmarking against Sonoma County Water Agency SMP

The District SMP is benchmarked against the SCWA SMP mitigation because the activities and habitat types are comparable. Both programs involve sediment removal, bank stabilization, and vegetation management in wetland and riparian habitats.

The District and the SCWA programs differ in the number of miles of streams covered under each SMP. The District SMP covers approximately 800 miles of stream and the SCWA SMP covers 205 miles of stream. Both of the SMPs cover natural and modified channels.

The District SMP and the SCWA SMP have different approaches to mitigation. Table C-8 provides a summary of the differences between the District and the SCWA SMP mitigation programs. Total District impacts are about 10 times greater than the SCWA impacts and total District SMP mitigation is about 30 times greater than SCWA total SMP mitigation. This difference in the total acres of mitigation is primarily due to the use of off-site land acquisition at a very high mitigation ratio as a main component of the SMP1 mitigation.

Figure C-2: Comparison of Habitat Improvement Mitigation Ratios for SMP1 and Watershed Projects



Note: The numbers above the bars refer to the acres of impacted habitat that is being mitigated at the associated ratio.

Comments from District and SCWA staff also provide some insight into the difference in the area of impacts. District staff commented that impact determinations are often conservative and overestimate the acreage of habitat that is actually impacted. The final impact is not tracked by the District. Thus, for many projects the District may be mitigating for impacts that never occurred, and conversely there is no way to verify that the area that the District impacted was fully covered by the proposed impacts.

Land Acquisition Mitigation

The District SMP1 and the SCWA differ in the approach to mitigation. The SCWA does not have a land acquisition mitigation component. They do, however, fund a Watershed Partnership Program whereby SCWA funds restoration projects. A large component of the SMP1 Mitigation (820 to 1,080 acres) is the land acquisition-based stream and watershed mitigation. The limited availability of land that meets mitigation requirements and the difficulty in negotiating long-term management plans and conservation easements also makes it difficult to implement mitigation.

Table C-8: Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Project Comparisons				
Miles of streams	800 miles	800 miles	205 miles	SMP has four times more miles of stream
Number of years the SMP has been in effect	10	1	5	SMP1 has 5 more years that it has been in effect.
SMP activities	Sediment removal, bank stabilization, vegetation management	Sediment removal, bank stabilization, vegetation management	Sediment removal, bank stabilization, vegetation management	Same activities
Acres of impacts	248 acres (habitat improvement) 92 acres (land-acquisition)	Not Applicable[1]	32.83 acres (habitat improvement)	SMP1 has 10 times more impacts
Acres of habitat restoration mitigation	307	Not Applicable[1]	37.05 acres	SMP1 has 8 times more acres of mitigation required
Acres of land acquisition	820 - 1,080	Not Applicable[1]	Not Applicable[2]	SCWA SMP allows for paying a fee to a third-party for land acquisition and management
Mitigation Ratios				
Invasive Plant Management	0.33:1[3] 1.9:1	1:1[4] 2:1	1.1:1	SMP1 and SMP2 have more and larger ratios

Table C-8 (*Continued*): Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Riparian Restoration	Not Applicable	1.1:1[5] 1.3:1 1.5:1 2:1	1.1:1	SMP2 has more and larger ratios
Trees and Shrubs (Vegetation)	1:1[6] 3:1	1:1[7] 1.1:1 1.3:1 1.5:1 2:1 3:1	1.5:1[8] 2:1	SMP2 has more and larger ratios
In-stream Complexity	Not Applicable	1:1	1.1:1	SCWA SMP has a larger mitigation ratio than SMP2
Land Based-Acquisition Mitigation	10:1[9] 15:1	1:1[10] 2:1 3:1 4:1	Not Applicable	SMP2 has more ratios; SCWA does not have this requirement
Large Woody Debris	Not Tracked	1:1	Not Applicable	SCWA does not have this activity
Bank Planting	1:1[11] 3:1	1:1[12] 1.3:1 1.5:1 2:1 2.5:1 3:1	1.1:1	SMP2 has more ratios than SMP1 and SCWA SMP
Minor Work Activities	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Nontidal Wetland: Freshwater Wetland Creation/Restoration component	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Tidal Wetland	1:1	Not Applicable	Not Applicable	Unique SMP1 activity
Special-Status Species Mitigation Ratios				
CRLF	1:1	3:1	1.1:1	SMP2 has larger ratios than SMP1 and SCWA SMP
California Tiger Salamander (CTS)	Covered with the Stream and Watershed Protection mitigation	3:1	2:1[13] 1:1 0.2:1	SMP2 has larger mitigation ratios that SCWA SMP. SCWA SMP has smaller ratios depending on distance from CTS habitat

Table C-8 (*Continued*): Comparison of SCVWD and SCWA SMPs

	SCVWD SMP1	SCVWD SMP2	SCWA	Comparison
Least Bell's Vireo	Covered with the Stream and Watershed Protection mitigation	3:1	Not Applicable	SCWA SMP does not have this mitigation requirement
Salt Marsh Harvest Mouse	3:1[14]	3:1	Not Applicable	SCWA SMP does not have this mitigation requirement
Clapper Rail	3:1[14]	3:1	Not Applicable	SMP1 and SMP2
Sonoma Sunshine	Not Applicable	Not Applicable	3:1	Unique SCWA impact
Burke's goldfields	Not Applicable	Not Applicable	3:1	Unique SCWA impact
Sebastool Meadowfoam	Not Applicable	Not Applicable	2:1	Unique SCWA impact

[1] This is not applicable because the District has just begun to mitigate for impacts

[2] SCWA does not have land acquisition mitigation. Instead, SCWA funds Tier 3 projects to be implemented with local non-profit agencies, municipalities, restoration organizations, creek groups, schools, and/or Resource Conservation Districts. SCWA contributes 10 percent of the annual cost of implementing SMP sediment removal and bank stabilization projects to fund projects that provide water quality, habitat, and ecosystem benefits.

[3] The 0.33:1 mitigation ratio applies to Smooth Cordgrass Control. The 1.9:1 ratio applies to Giant Reed Control

[4] Ratio of 1:1 applies to Tier 1 species (invasive plant control requires two years or less time to achieve). Ratio of 2:1 applies to Tier 2 species (invasive plant control requires more than two years to achieve).

[5] Mitigation ratios depend on the maintenance activity and the type of channel where the maintenance activity was conducted (modified channel, modified channel with ecological value, and unmodified channel). Refer to Table F-1 in Appendix F.

[6] The 1:1 ratio applies to non-native vegetation species and the 3:1 ratio applies to native vegetation species.

[7] Mitigation ratios depend on the size of the tree or shrub that was removed and the type of channel where the maintenance activity took place. Refer to Table F-1 in Appendix F.

[8] The 2:1 ratio applies to native trees and the 1.5:1 ratio applies to non-native trees.

[9] Note: This applies to the freshwater wetland creation and restoration. The 10:1 ratio applies to lands adjacent to stream resources up to 50 feet from the centerline of first order streams and 150 feet from the centerline of second order and greater streams. The 15:1 ratio applies to lands from 150 feet up to 500 feet from the centerline of second-order and greater stream.

[10] The mitigation ratio depends on the function of the mitigation and whether it is in-kind or out-of kind. Refer to Table F-1 in Appendix F.

[11] The 1:1 ratio applies to temporary impacts and the 3:1 ratio applies to permanent impacts.

[12] The mitigation ratios depend on the construction activity and the channel type (modified, modified with ecological value, or unmodified). Higher mitigation is a result of construction treatments where the rock area is left unplanted. The additional mitigation is required to compensate for the loss of channel functions due to the placement of non-vegetated rock.

[13] The 2:1 ratio applies to habitat affected 500 fee from known CTS occurrence, the 1:1 ratio applies to habitat affected 2,200 feet from known CTS occurrence, and the 0.2:1 ratio applies to habitat affected greater than 2,200 feet and less than 1.3 miles from known CTS occurrence.

[14] Eleven acres of Clapper Rail and Salt Marsh Harvest Mouse habitat were estimated to be impacted by the SMP1. Thirty acres of tidal wetlands were restored for impacts to tidal wetlands. The mitigation was applied to both effects.

Habitat Improvement Mitigation

The District SMP1 and the SCWA SMP differ in the total acres of habitat improvement required as mitigation. The District SMP1 requires habitat enhancement of 307 acres while the SCWA requires habitat enhancement of 37.05 acres. The District is required to enhance roughly eight times more habitat than SCWA. The larger acreage for District habitat enhancement is proportional to the District's larger acreage of impacts. The District's SMP1 mitigation ratio is approximately 1.3:1 for habitat improvement and the SCWA mitigation ratio is approximately 1.1:1. The District and SCWA are mitigating for impacts at similar ratios.

SMP2 Benchmarking

Mitigation Ratios

The structure for determining mitigation for the SCWA SMP is much simpler than the District SMP2 (Table C-8). Mitigation ratios for the District SMP2 starts with a range from 1:1 to 4:1 depending on several factors, and may be increased depending on the type of mitigation and agency direction, while mitigation ratios for the SCWA SMP generally stay at 1.1:1, with the exception of impacts to trees and mitigation that does not meet success criteria.

SCWA is starting to have difficulty identifying adequate area to fulfill off-site mitigation. Most of the compensation occurs on-site, with 10 percent of the mitigation being established through an off-site Watershed Partnership Program. SCWA faces the issue of not having enough area on their property to fulfill the mitigation dictated by high ratios. SCWA must compensate for native trees at a 2:1 ratio but is running out of land to plant the trees and must reassess their ability to complete their mitigation.

Watershed and Water Utility Projects

District projects have similar mitigation ratios to benchmark agency projects. Table C-9 provides a summary of the comparison between the District and benchmark agency mitigation.

Mitigation for Riparian Habitat

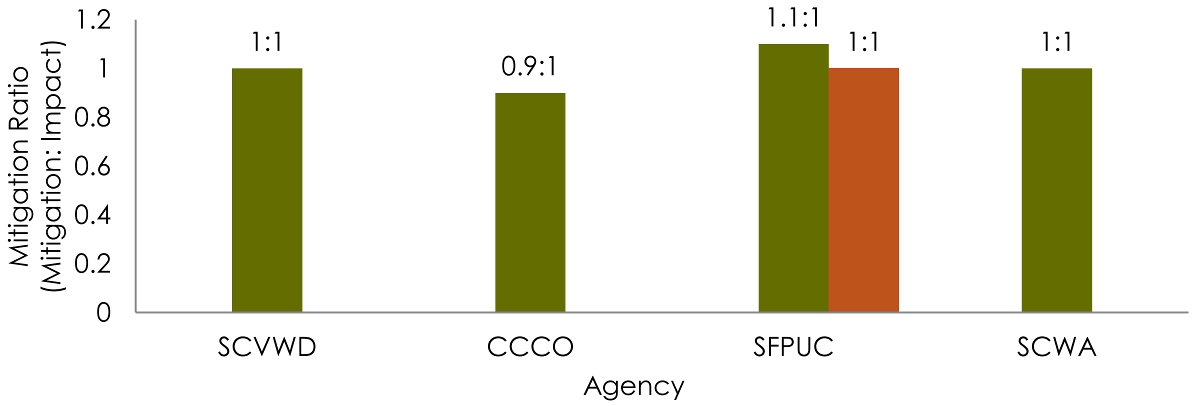
Temporary Impacts

Mitigation for temporary impacts to riparian habitat is generally similar between the District and the benchmarking agencies. Temporary impacts to riparian habitat for District projects are mitigated at a 1:1 ratio. Benchmarking agencies are mitigating at similar ratios. SFPUC and SCWA have two projects with the same 1:1 mitigation ratio. One SFPUC projects has a mitigation ratio (1.1:1) that is marginally higher than the District's mitigation ratios. Figure C-3 shows the mitigation for the District and the benchmarking agency projects. SCWA have two projects with the same 1:1 mitigation ratio. One SFPUC projects has a mitigation ratio (1.1:1) that is marginally higher than the District's mitigation ratios. Figure C-3 shows the mitigation for the District and the benchmarking agency projects.

Table C-9: Summary of Watershed and Water Utility Projects Benchmarking

Type of Mitigation	SCVWD Mitigation Ratio	Benchmarking Agency Mitigation Ratio
Riparian Mitigation		
Mitigation for temporary impacts to riparian habitat	1:1	0.9:1 1:1 1.1:1
Mitigation for permanent impacts to riparian habitat	1.5:1 2:1 2.4:1 3:1 4:1	0.6:1 3:1 4.3:1
Wetland Mitigation		
Mitigation for temporary impacts to wetlands	1:1	1:1 1.1:1 1.56:1
Mitigation for permanent impacts to wetlands	1:1 1.4:1 2:1 3:1	3:1
Mitigation for Trees		
Mitigation for non-native trees	1:1 2:1	1:1
Mitigation for native trees	3:1	3:1
Mitigation for oak trees	10:1	10:1
Land-Acquisition Based Mitigation		
Land-Acquisition Mitigation	10:1 15:1	14:1 1.8:1
Note: Comparisons between District mitigation and benchmarking agency mitigation are made according to similar mitigation requirements. Not every benchmarking agency had the same type of mitigation and were therefore not included in every comparison. CCWA, EBMUD, and MMWD were not included in the riparian mitigation comparison, CCWA, EBMUD, MMWD were not included in the wetland mitigation comparison, and SPFUC and EBMUD were not included in the tree mitigation comparison because no mitigation for those respective habitats were identified in the review of those benchmarking projects.		

Figure C-3: Mitigation Ratios for Temporary Impacts to Riparian Habitat



Permanent Impacts

Mitigation ratios for permanent impacts to riparian habitat vary not only between the District and the benchmarking agencies but within the District itself. Figure C-4 shows variations in mitigation ratios. Mitigation ratios vary from 1.5:1 to 4.3:1.

Mitigation for Wetlands

Temporary Impacts

Mitigation for temporary impacts to wetlands is similar between the District and the benchmarking agencies. Mitigation ratios range from 1:1 to 1.56:1. The 1:1 mitigation ratio for the District was required by the SFRWQCB and the ACOE on two separate projects. The 1.1:1 mitigation ratio for SFPUC was required by the CDFW and the 1.56:1 mitigation ratio for the SCWA was required by the North Coast RWQCB. While the benchmarking agency mitigation ratios for temporary impacts to wetlands are marginally higher than the District's the mitigation ratio is very similar across agencies particularly in light of the limited number of projects and permits reviewed with temporary impacts to wetlands. Figure C-5 shows the mitigation ratios for temporary impacts to wetlands.

Permanent Impacts

Mitigation ratios for permanent impacts to wetlands range from 1:1 to 3:1 between the District and the benchmarking agencies. The District is mitigating for permanent impacts to wetlands at the same or a lower ratio than the benchmarking agencies. Figure C-6 depicts the District and benchmarking agencies mitigation ratios for permanent impacts to wetlands.

Figure C-4: Mitigation Ratios for Permanent Impacts to Riparian Habitat

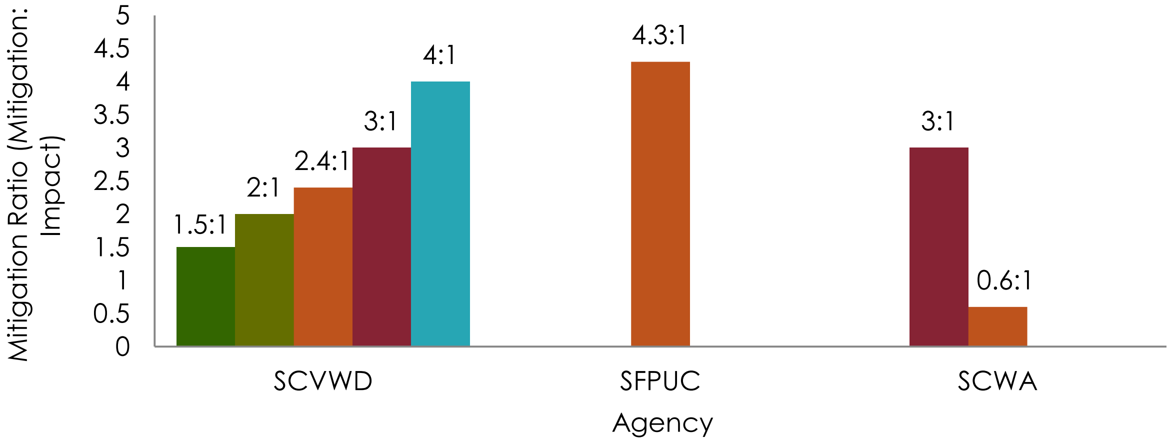


Figure C-5: Mitigation Ratios for Temporary Impacts to Wetlands

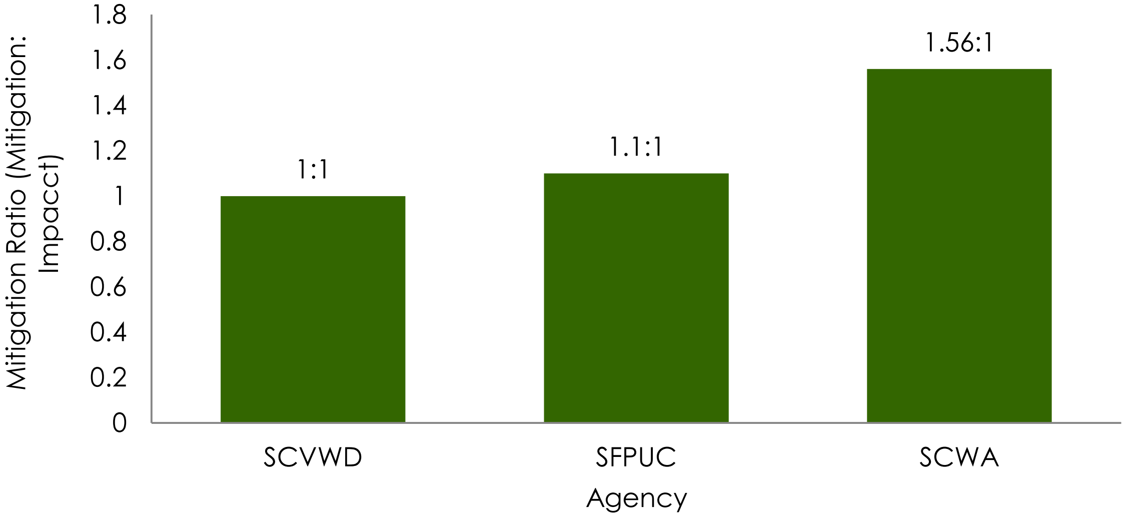
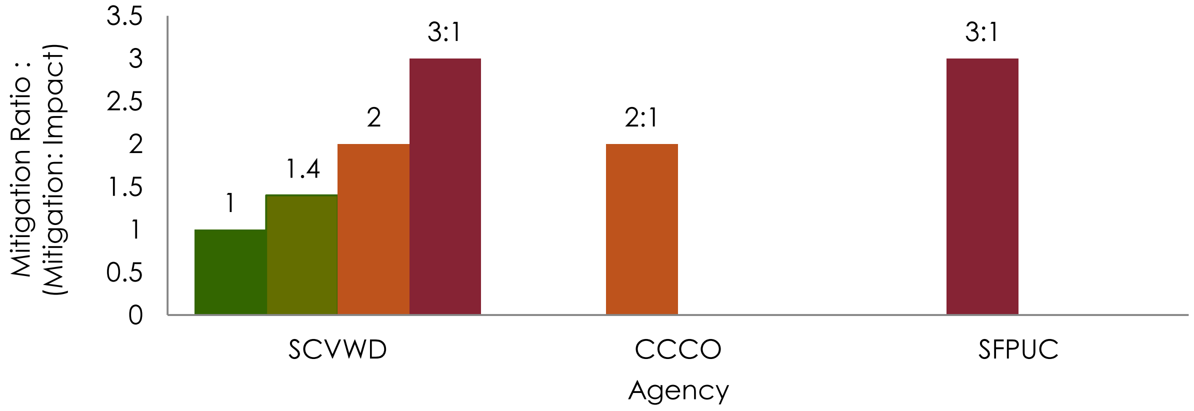


Figure C-6: Mitigation Ratios for Permanent Impacts to Wetlands



Mitigation for Trees

Mitigation ratios for trees are consistently applied to the District and the benchmarking agencies' projects (Figure C-7). Non-native trees are mitigated at a 1:1 or 2:1 ratio, native trees are mitigated at a 3:1 ratio, and oak trees are mitigated at a10:1 ratio.

Land-Acquisition Mitigation

Two benchmarking projects for EBMUD and SFPUC have land acquisition-based mitigation. The mitigation ratio for EBMUD is similar to the District's ratio. EBMUD negotiated mitigation with the regulatory agencies and proposed the restoration of land that EBMUD owned, adjacent to the project site. The land acquisition mitigation ratio for the SFPUC project is much smaller than the District and EBMUD mitigation ratio. The smaller ratio is due to the re-inundation of previously impacted habitat. Figure C-8 shows these mitigation ratios. Higher ratios are sometimes the result of acquiring an available parcel of land at a reasonable price.

Monitoring Time Frames

The monitoring time frames for District projects differ substantially from those identified in the benchmarking agency projects (Figure C-9). No benchmarking project had a monitoring time frame longer than 10 years. In contrast, 7 of the 21 District projects (33 percent) have a monitoring time frame of 100 years. Long monitoring time frames is a unique issue that the District faces.

Figure C-7: Mitigation Ratios for Trees

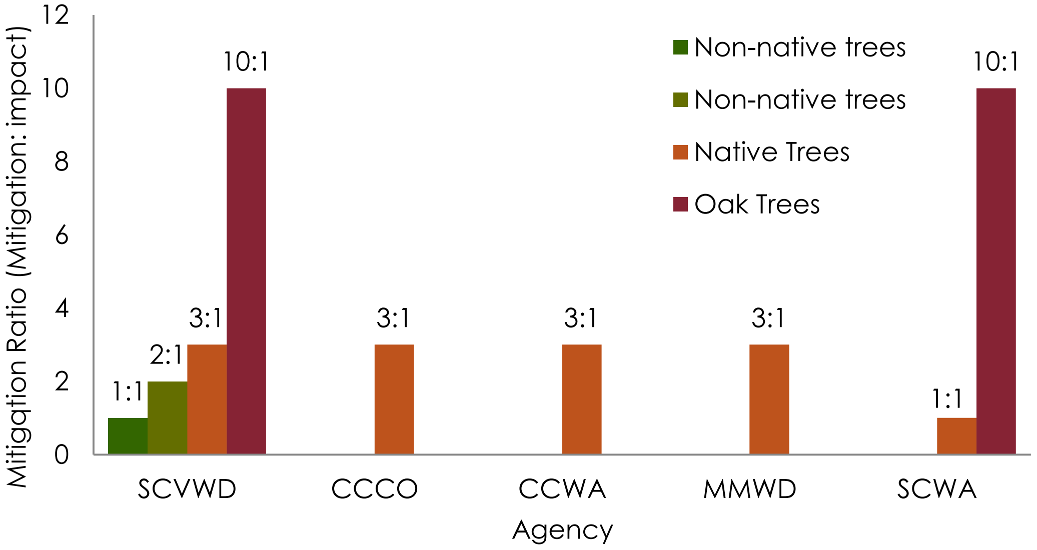


Figure C-8: Ratios for Land-Acquisition Mitigation

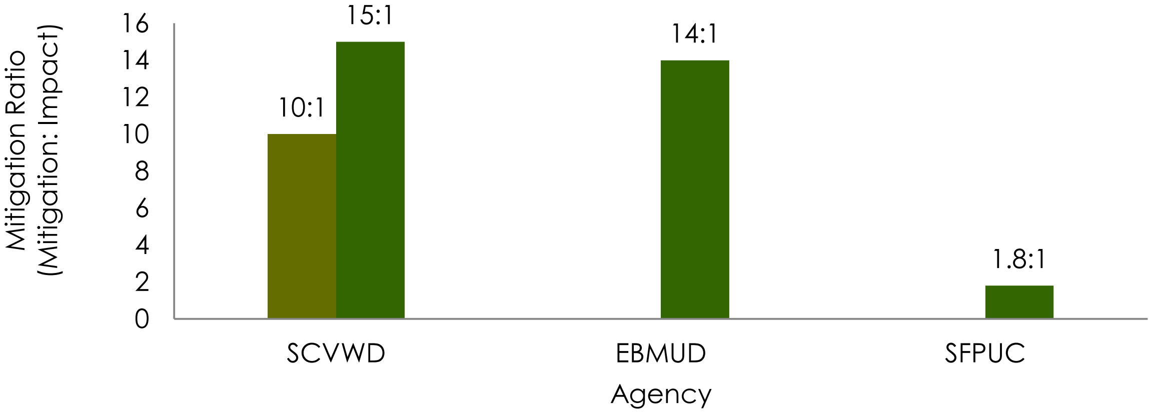
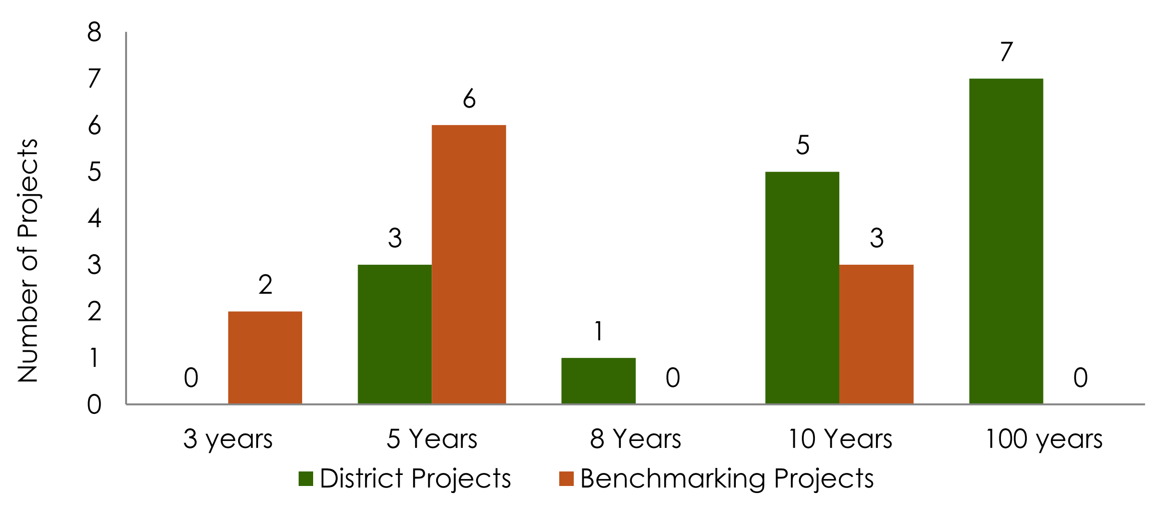


Figure C-9: Monitoring Time Frames for Mitigation (by project)



Inconsistency between Regulatory Agencies

The District and benchmark agency permits show that mitigation requirements are not consistent between regulatory agencies. Table C-10 demonstrates two instances of different requirements between regulatory agencies. SFRWQCB and CDFW required different levels of mitigation for the SFPUC San Antonio Backup Pipeline Project. There were also different requirements between SFRWQCB, USFWS, and CDFW for stream, riparian, open waters, and wetlands habitat for the Calaveras Dam Replacement Project.

Benchmarking Interviews

Comments from the interviews with the benchmarking agency staff highlight diversity in approaches to fulfilling mitigation. A summary of the comments from the benchmarking agencies is shown in Table C-11.

Scope of Mitigation

Benchmarking agency staff identified concerns similar to those of District staff, including:

- Inappropriately large mitigation ratios
- Ineffective permit negotiation

The benchmarking agencies, however, have less mitigation for their projects. Staff at EBMUD and MMWD mentioned that they rarely are required to compensate with habitat restoration for project impacts. This difference has to do with the kinds of projects that these benchmarking agencies implement. The benchmarking projects are generally smaller and therefore do not impact as much land. SCWA is the benchmarking agency most similar to the District with the most similar project; however, SCWA still has fewer impacts that require mitigation when compared with the District.

Table C-10: Inconsistencies in Benchmarking Project Mitigation Between Regulatory Agencies

Benchmarking Agency	Project	Agency	Habitat	Impacts (Acres)		Mitigation Ratio	Mitigation Required (Acres)
				Temporary	Permanent		
SFPUC	Calaveras Dam Replacement Project	CDFW	Perennial, intermittent, and ephemeral creek channel	0.1 1,281 linear feet	0.55 4,593 linear feet	1.1:1 (temp) 3:1 (perm)	1.76 15,158 linear feet
			Seasonal Wetland	0.06	0.07	1.1:1 (temp) 3:1	2.76
			Freshwater Marsh	None	1.04	3:1 (perm)	3.12
			Riparian (coastal live oak, willow, central coast oak)	0.34	2.24	1.1:1 (temp) 3:1 (perm)	6.72
		SFRWQCB	Wetland, stream, riparian, and open water habitat	16.57	20.29	3:1 (perm)	112
		USFWS	Wetland, waters, and upland habitat	300	350[1]	1.8:1 (not specified)	1,151.49
	San Antonio Backup Pipeline	SFRWQCB	Riparian	0.45	0.03	1:1 (temp) 4.3:1 (perm)	0.58
		CDFW	Riparian	0.45	0.03	0.3:1	0.14

[1] The 350 acres represent a permanent loss of habitat due to the re-inundation of the reservoir once the dam is replaced

Table C-11: Summary of Benchmarking Agency Comments

Agency	Agency Projects	Amount of Mitigation	Negotiation		Does the agency track mitigation? (Y/N)
			Permit Negotiator	Do they re-negotiate?[1]	
Santa Clara Valley Water District	SMP, flood protection, water infrastructure	Large	Case-by-case basis, project managers (engineers), biologists, planning department, upper management	N	Y
Benchmarking Agencies					
SCWA	SMP, flood protection, water infrastructure	Large	Environmental Planner	Y	Y
CCCO	Road safety, road widening, bridge replacement	Small	One staff member, depends on project	Y	N
EBMUD	Water infrastructures, dams, pipelines	Small[2]	Case-by-case basis, environmental planners or the design team	N	N
MMWD	Pipeline projects, culvert replacements	Small	District's Environmental Service Coordinator	Y	Y[3]

[1] This refers to negotiation of mitigation after the permit has been issued

[2] Note: Interviewed staff at EBMUD mentioned that they rarely have projects with mitigation. The San Pablo Dam Seismic Upgrade Project was an exception. They were required to mitigate with 37 acres of CRLF and Alameda Whipsnake Habitat

[3] Note: Although they track implementation and success of mitigation, it is not necessary because there are few mitigation activities that need to be tracked.

Permit Negotiation

A key issue identified in the Compensatory Mitigation Audit was the permit negotiation process. Several District staff commented that mitigation obligations tended to be higher when staff engineers negotiated the permits. This is an issue that has been identified by the District in the past. The *Biological Surface Water Quality Monitoring Activities Evaluation Report*, prepared by the District in 2002 recommended a process to facilitate communication and collaboration between project managers (engineers) and staff scientists. The evaluation report notes that the project managers are generally more concerned with the speedy completion of a project and are not accountable for the level of mitigation. Staff engineers may agree to inappropriately high mitigation to complete the permitting process. Staff at EBMUD expressed this concern during their interview. Staff at EBMUD commented that the watershed group of EBMUD believed that they went over the top with their mitigation and that it was due to accepting whichever requirements were proposed in order to move the project forward. EBMUD does not have one set group that negotiates the permits; it varies on a case-by-case basis with environmental planners and the design team doing the negotiating.

The findings from the benchmarking interviews are consistent with the recommendations made in this audit's preliminary report of findings. An environmental planner is often best qualified to negotiate the permits for the District projects. The involvement of a CEQA attorney may also serve to ensure that mitigation is legally appropriate. A CEQA attorney should participate in defining mitigation during the preparation of the CEQA document.

Regulatory Agency Influence

Interviews with District staff revealed that regulatory agencies often dictate mitigation. District staff commented that the large number of mitigation ratios in the SMP2 was a direct result of regulatory agency direction.

This issue of regulatory agency direction was echoed by CCWA. The regulatory agencies dictated the acquisition of specific lands for mitigation, which resulted in mitigation at large ratios:

- Acquisition of mitigation for lands at a 9:1 ratio for a dam rebuilding project
- Mitigation for 2 acres of impact to Delta smelt at an 18.5:1 ratio

Conclusions

The conclusions of the benchmarking review are detailed below.

- The District has the longest mitigation monitoring time frames with 10 years and 100 years of monitoring versus 5 years of monitoring for most of the benchmarking projects.
- The SCWA SMP has a much simpler approach to defining impacts and defining and completing mitigation than the District SMP1 and SMP2, which results in a simpler compliance process.
- There were slight differences between the SMP1 and Watershed Division required mitigation. Watershed projects did not have land acquisition mitigation. Watershed

projects had slightly higher ratios for habitat enhancement mitigation. The highest mitigation ratio for the SMP1 is 1.9:1 compared to 4:1 for the Watershed projects.

- Habitat enhancement mitigation for temporary impacts is consistently applied between the District and the benchmarking agencies. Temporary impacts are generally mitigated at a 1:1 ratio with some exceptions (0.9:1, 1.1:1, and 1.56:1).
- The regulatory agencies consistently require greater mitigation ratios for permanent impacts than for temporary impacts (for both the District and benchmarking agencies); however, the regulatory agencies set different mitigation ratios. Mitigation ratios for permanent impacts range from 1.5:1 to 4.3:1.
- Several benchmarking agencies, such as CCWA, EBMUD, and SFPUC had projects with large land-acquisition mitigation requirements.

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APPENDIX D

Summary of Recommendations

APPENDIX D: SUMMARY OF RECOMMENDATIONS

1. IMPROVE THE MITIGATION MEASURE AND PERMIT NEGOTIATION PROCESS

1a. Revisit and Implement Previous Recommendations made about the Permit Negotiation Process

2002 Monitoring Evaluation Report

The "Biological and Surface Water Quality Monitoring Activities Evaluation Report" (Ali-Adeeb 2002) was prepared to help the District prepare for increases in monitoring activities by making those efforts more efficient. The 2002 report highlighted inefficiencies in the District negotiation process and provided recommendations for efficient compensatory mitigation negotiation. The recommendations are still pertinent and demonstrate a consistent set of issues in the District's mitigation program. The following conclusion was made in the 2002 report:

- The District does not use the knowledge obtained from monitoring to leverage better deals when negotiating with regulatory agencies.

Recommendation 1a: Revisit previous recommendations regarding mitigation.

1b. Use a CEQA Lawyer to Negotiate Mitigation Measures, Land Management Plans, and Conservation Easements to Ensure the Efficient, Cost Effective, and Timely Completion of Mitigation with Land Management Plans and Conservation Easements

The District is still in the process of completing the nontidal wetland creation and stream and watershed protection mitigation requirements. The remaining nontidal wetland mitigation area and 65 to 85 percent of the required mitigation area for stream and watershed protection were purchased by the District. Agency approval of the mitigation sites has been delayed because the agencies have not agreed to the management agreements for the sites.

Recommendation 1b: The District should use a CEQA lawyer to negotiate the land management plans and conservation easements. This will ensure the efficient and timely completion of mitigation that requires land management plans and conservation easements.

1c. The District Environmental Planner Should Negotiate Permits with the Regulatory Agencies

One of the primary issues identified in the staff interviews was the negotiation of compensatory mitigation requirements. Several staff indicated that the project schedule unduly influenced the negotiations with regulatory agencies. The need to meet the schedule is a primary reason for the large mitigation ratios and long-term monitoring requirements. The project managers, who are engineers, often negotiate the permit requirements. The engineers likely do not have the necessary experience or understanding of the long-term cost to implement the requirements.

This flaw was identified in the 2002 Monitoring Activities Evaluation Report. The report recommended that "project managers and scientists should help prepare scopes for specific monitoring projects, but qualified staff whose primary assignment is to integrate the District's monitoring efforts into a unified, efficient, and effective program should mediate the process" (Ali-Adeeb et at. 2002).

Recommendation 1c: There should be one person responsible for negotiating the permit requirements for each project. A CEQA attorney should provide assistance with the negotiations to ensure mitigation requirements do not exceed regulatory authority. Additionally, the environmental mitigation & monitoring unit should provide assistance with the negotiations because they are responsible for the implementation of the requirements. The priority of the assigned planner, CEQA attorney, and environmental mitigation & monitoring staff is to negotiate reasonable, feasible, and cost-effective mitigation requirements.

1d. Allow More Time for Permitting

The difficulty of permit negotiations is exacerbated by short project timelines. Staff cited short project timelines and impending project construction deadlines as obstacles for effective negotiation of compensatory mitigation requirements. Short project timelines do not leave enough time for permit negotiations and make it more likely for staff to agree to extreme mitigation requirements that may be difficult or expensive to complete. The compensatory mitigation requirement and compliance data indicate that the District has greater requirements and has problems complying with mitigation for large projects. Additional time is necessary to negotiate feasible permit requirements for large projects.

Recommendation 1d: The District should take the permitting timeline into account when creating deadlines for projects. The District should allow at least 3 months on small projects and 12 months on large projects to negotiate compensatory mitigation requirements and obtain permits from regulatory agencies. Additionally, the project planning and budget should include timeframes and estimates for permit negotiation.

1e. Improve Continuity in Environmental Participation from Design Phase through Construction

Staff cited inefficiencies in the project permitting and mitigation implementation procedures. There is currently no designated staff person that follows a project from the initiation through construction to completion; rather, District staff work on distinct phases of the project permitting or implementation and there is limited communication between staff members during project hand-off, if any. The planners write the CEQA documents, the project managers negotiate the permits and implement the project, construction staff or contractors implement the mitigation, and the environmental mitigation and monitoring division conducts monitoring and reporting of biological mitigation sites.

This process is problematic because decisions regarding compensatory mitigation monitoring are not being made by the individuals that are writing the mitigation requirements in the CEQA documents, or by the individuals that are implementing the measures. There should be continuity between project phases so that the groups working on different aspects of the project have knowledge and a voice in the decisions that will affect their work.

Recommendation 1e: The District should specify procedures to provide continuity in the mitigation design, implementation, and monitoring process. The project planner should be involved in mitigation specification and design, CEQA review and permit negotiation, mitigation implementation during construction and impact verification after construction.

1f. Enhance On-Site Habitat, Avoid Land-Acquisition Mitigation

The District had difficulties implementing the land-acquisition mitigation for the SMP1. Land acquisition is outside of the District's mission and would be better conducted by specialists. Third-parties such as the Nature Conservancy and open-space districts specialize in land acquisition. The District should avoid land-acquisition mitigation and if not possible, develop partnerships with third party land conservancies to fund habitat acquisition.

Recommendation 1f: Enhance on-site habitat; if not possible, fund habitat acquisition through a third party

2. TRACK IMPACTS AND MITIGATION IMPLEMENTATION TO AVOID EXPENDING MORE THAN REQUIRED ON MITIGATION

2a. Revisit and Implement Previous Recommendations to Improve the Negotiation Process

The "Biological and Surface Water Quality Monitoring Activities Evaluation Report" (Ali-Adeeb 2002) made the following conclusion about mitigation tracking:

- There are flaws in the District's tracking of mitigation monitoring activities and there is a need for better data management structures and procedures, including consistent staff access to monitoring data.

Recommendation 2a: Revisit previous recommendations regarding mitigation.

2b. Define Actual Impacts of Previous Projects and Compare to Mitigation Implemented to Determine Whether Excess Mitigation is Available for other Projects

The District currently does not track actual project impacts relative to permitted impacts. Compensatory mitigation requirements are defined by the preliminary impacts identified in the CEQA documents and permit applications. It is possible that the District is mitigating for impacts that were planned, but never occurred. Inefficient mitigation tracking may result in over-estimation of compensatory mitigation obligations. Mitigation obligations may in fact be lower than those detailed in this preliminary report and permit documents. Additionally, it is important that the District have a clear record of the final decision of impact area by the regulatory agencies. The NMFS Biological Opinion (BO) for the Lower Guadalupe River Project had ambiguous language about the area of habitat that would be impacted by the project. It is important to track the final impact areas and share them with the regulatory agencies, so that the District and the regulatory agencies are in agreement about mitigation obligations.

Recommendation 2b: The District should track final project impacts and use those calculations to determine the need for the specified compensatory mitigation. The District should notify the agencies if the actual impact was less than the planned impact and request a reduced compensation requirement relative to the reduced impact. The excess mitigation should be applied to other appropriate projects with similar mitigation requirements.

2c. Consolidate the Mitigation Tracking Databases and Include a GIS Element

Staff cited the tracking of mitigation monitoring activities as an obstacle to compliance with District compensatory mitigation requirements. This is not a new issue. In fact, the 2002 report cited flaws in the tracking of mitigation monitoring and cited the need for better data management structures and procedures.

Currently, compensatory mitigation data is tracked in several databases, including:

1. Mitigation and Monitoring Activities Database (MMAD). This is an in-house Oracle Database
2. Ecological Monitoring Information Management Systems (EMISMS)
3. WPMS Permit Database
4. Vegetation Management GIS Database
5. 2014 Compensatory Mitigation Compliance Audit

Recommendation 2c: The District should consolidate their databases so that all pertinent compensatory mitigation information is located in one place. The database should be made available to all staff and should include the following information:

1. Project name
2. Habitat type or species associated with compensatory mitigation
3. Proposed impact acreages
4. Final impact acreages
5. CEQA mitigation measures
6. Regulatory agency permits
7. Permit conditions, by agency
8. Verification of compliance with mitigation measures and permits conditions with annual updates
9. Required monitoring timeframes
10. GIS element
11. Agency sign-off

The consolidated database should include simple reporting functions so that planners and managers can all easily track the compliance status of any active District mitigation project.

3. IMPROVE DISTRICT STRUCTURE AND PROCEDURES FOR PERMITTING

3a. Revisit and Implement Previous Recommendations Made about the Permit Negotiation Process

The "Biological and Surface Water Quality Monitoring Activities Evaluation Report" (Ali-Adeeb 2002) made the following conclusions about the District structure and procedures:

- The District needs qualified staff whose primary assignment is to integrate the District's monitoring efforts into a unified, efficient, and effective program
- The District lacks communication between engineering Project Managers and staff scientists. Project Managers focus on obtaining regulatory approvals or settlements quickly so that projects, operations, and maintenance can proceed. Staff scientists are focused on providing accurate and defensible scientific and technical analysis. Because of these differing priorities it is important that there is a process to facilitate communication and collaboration between project managers and staff scientists.

Recommendation 3a: Revisit previous recommendations regarding mitigation.

3b. Specify Procedures for CEQA Planners to Conduct Mitigation Monitoring or Reporting following Completion of the CEQA Document

CEQA mitigation compliance is not consistently implemented at the District. In some cases, the planner follows mitigation compliance through construction. In other cases, the project planner completes the CEQA document and does not follow through to construction. Some staff indicated that the mitigation measures in the CEQA document are included in the project construction contract and it is the responsibility of the construction staff to verify implementation of the measures.

Mitigation measures to avoid or reduce significant impacts are a critical part of CEQA and protecting the environment. CEQA Guidelines (§15097(a)) state:

> "In order to ensure that the mitigation measures and project revisions identified in the EIR or negative declaration are implemented, the public agency shall adopt a program for monitoring or reporting on the revisions which it has required in the project and the measures it has imposed to mitigation or avoid significant environmental effects."

CEQA Guidelines (§15097(c)) state:

> "Reporting" generally consists of a written compliance review that is presented to the decision making body or authorized staff person. "Monitoring" is generally an ongoing or periodic process of project oversight."

District staff have indicated that this CEQA provision is not consistently implemented.

Recommendation 3b: The District should specify procedures for CEQA planners to conduct mitigation monitoring or reporting following completion of the CEQA document. The process should include preparing a Mitigation Monitoring and Reporting Compliance Plan. Ideally, there would be periodic monitoring of construction to ensure measures are implemented as intended. At a minimum, the CEQA practitioner should receive and review compliance reports from the construction monitors.

3c. Increase Collaboration between Environmental Units

A consistent comment from staff was that there needs to be more communication between the engineers designing the project, the CEQA practitioners evaluating impacts and defining mitigation, and the staff tasked with implementing the mitigation. The environmental program at the District is inconsistently implemented, in spite of having very detailed procedures in place. Collaboration between environmental units at the District would facilitate consistent implementation of District policies and procedures.

Recommendation 3c: The District should increase collaboration between environmental staff from Watersheds and Water Utility, including the Revegetation and Mitigation Monitoring staff. One way to increase collaboration is to consolidate the environmental staff, into one group/unit.

3d. Hold In-House Training for CEQA and Regulatory Requirements, and the District's Mitigation and Maintenance Process

The District currently does not have adequate staff to fully implement and track compliance. District environmental staff stated that some District engineers ignore the mitigation and maintenance requirements for the project because they lack sufficient experience to fully evaluate those costs. Regulatory training could also help ensure that all staff understands the definition of a project under CEQA and when a permit is required. Add training in environmental regs, env. Training engineers, train in permitting. Trainees should include CEQA staff, engineers, biologists, and legal staff.

Recommendation 3d: The District should hold in-house training for CEQA and regulatory requirements, and the District's mitigation and maintenance process. The in-house training should include:

- What triggers CEQA
- When is a permit required
- Implementing regulations for the permitting agencies
- Overview of costs to implement mitigation and maintenance on District Projects

The training should include CEQA planners, engineers, biologists, and legal staff

3e. Future SMP Should Define a Process Similar to Sonoma County Water Agency's SMP where Interim Agency Authorizations are not Required, In Order to Function More Like A Program

The results from the Audit indicate that the SMP2 does not function like a program, meaning that the SMP2 is not following programmatic guidelines. There are mitigation ratios in the SMP2 manual; however, they are not consistently followed. Regulatory agencies have the discretion to change mitigation ratios and the District is required to attain authorization from regulatory agencies throughout the implementation of the SMP2. Programmatic permits should allow the District to proceed with the assigned rule set defined in the SMP Manual; however, this is not being practiced with the SMP2.

The Sonoma County Water Agency's (SCWA) SMP is functioning like a program. Additionally, the SCWA SMP has reasonable mitigation ratios that are far simpler than the District's SMP2. The District should model the future SMP after the SCWA SMP.

Recommendation 3e: The District should define a process similar to Sonoma County Water Agency's SMP for the future SMP.

3f. Close-out Mitigation for Projects that Have Been Completed

The District has completed mitigation for 12 of the projects reviewed in the Audit. The District continues to monitor the project mitigation sites because the regulatory permits require monitoring for several more years. The District should negotiate with the regulatory agencies to deem the mitigation for these projects complete, thereby reducing the costs associated with mitigation monitoring.

In the past the District has requested that regulatory agencies deem mitigation requirements complete, this was done for mitigation for the Lower Coyote Creek Flood Control Project. The District should request that regulatory agencies deem mitigation complete as soon as they meet their measurable objectives.

Recommendation 3f: The District should ask for agency sign-off as soon as the measurable objective for mitigation is met.

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APPENDIX E

Excel Databases of Mitigation

APPENDIX E: EXCEL DATABASES OF MITIGATION

INTRODUCTION

Appendix E contains the two Excel databases that were used during the audit to record mitigation obligations for District and benchmarking agencies' projects.

Table E-1 is the Excel database for District projects. Table E-1 is organized by both the District project and the document where data was obtained. Each row has the corresponding document where data about the mitigation obligation was obtained. In addition to the mitigation obligations, Table E-1 contains information about project impacts, mitigation ratios, mitigation acquired by the District, and mitigation performance.

Table E-2 is the Excel database for benchmarking agencies' projects. Table E-2 provides the mitigation requirements for different benchmarking agencies' projects. This Excel database is organized by both the benchmarking agency and the regulatory agencies. Table E-2 shows the impacts, mitigation ratios, and mitigation required from different regulatory agencies for the benchmarking agencies' projects.

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Appendix E: Database of Compensatory Mitigation Obligations and Compliance

Note: Hatched cells indicate that the data was not available in that specific document.

Table E-1: Database of Compensatory Mitigation Obligations and Compliance

Appendix E: Database of Compensatory Mitigation Obligations and Compliance

Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP	*Final Environmental Impact Report for the Multi-Year Stream Maintenance Program*	2001	N/A (Online)	Bank Planting		1:1			N/A					The bank protection work would include both hardscape and softscape designs with mitigation provided at a 1:1 ratio by area of streambank for rock hybrid designs with plantings and 3:1 ratio by area of streambank for impervious hardscape and other rock designs without plantings. On an average annual basis, no more than one-half mile of impervious hardscape designs will be installed.	
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Bank Planting		3:1			N/A					The bank protection work would include both hardscape and softscape designs with mitigation provided at a 1:1 ratio by area of streambank for rock hybrid designs with plantings and 3:1 ratio by area of streambank for impervious hardscape and other rock designs without plantings. On an average annual basis, no more than one-half mile of impervious hardscape designs will be installed.	
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Bank Planting					N/A	5	At Year 5, 70% of original number of plants are healthy OR 50% of installed plants are healthy and 50% absolute cover of native vegetation			Success criteria for bank protection plantings shall follow BMP 2.4 with the following exceptions: a. At the end of five years, 70% of the original number of plants installed are alive and healthy, OR b. At the end of five years, 50% of the original number of plants installed are alive and healthy AND the site has 50% absolute cover of native vegetation. One-half of all mitigation shall be completed by the expiration date of this Agreement.	Agreement expires on December 31, 2006.
	Best Management Practices Under the Stream Maintenance Program	2002	N/A (Online)	Bank Planting					N/A	5	At Year 5, 70% of original number of plants are healthy OR 50% absolute cover of native vegetation			BMP 2.4, Success Criteria for Bank Protection Plantings: Monitoring shall be conducted annually for a minimum period of five (5) years or until success criteria for planting is met a minimum of two years after irrigation has been removed at the planting densities stated in the FEIR (See FEIR, Appendix E, page X-2)]. Revegetation will be judged successful and meeting full compliance if it meets these criteria: 1. 70% of the original number of plants installed are alive and healthy at the end of 5 years or 2. A site has 50% absolute cover of native vegetation within the 5-year period. If a site meets either of these requirements it will be judged as successful and monitoring will cease. 3. There will be no requirement for species diversity on bank protection projects. A variety of species replicating the natural plant community will be installed but ratios may adjust due to site conditions. A site will not be penalized due to a change in ratios or individual species dropping out.	Success Criteria for Bank Protection Plantings was left blank in FEIR to allow for additional changes
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	Bank Planting		3:1			N/A	10				The District will mitigate hardscape bank stabilization projects at a ratio of 3 linear feet of offsite restored riparian corridor for every 1 linear foot of hardscape installed.	
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	Bank Planting		1:1			N/A	10				Bank stabilization projects that are a mix of hardscape and plantings will be mitigated at a ratio of 1 to 1.	
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Bank Planting					N/A	5	At Year 5, 70% of original number of plants are healthy OR 50% of installed plants are healthy and 50% absolute cover of native vegetation			Success criteria for bank protection planting shall follow BMP 2.4 as described in the BMP Table of Appendix C of Exhibit C. Revegetation shall be considered successful and meeting full compliance if at the end of five years, 70% of the original number of plants installed are alive and healthy, or at the end of five years, 50% of the number of plants installed are alive and healthy and the site has 50% absolute cover of native vegetation. Exceptions to these success criteria shall be considered on a case by case basis, with a site-specific proposal submitted to DFG via mail or email for review and approval.	This agreement expires on December 31, 2011.
	Draft Environmental Impact Report and Stream Maintenance Program Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	California Red-Legged Frog Habitat			108		N/A					Under the Stream and Watershed Protection component of the Compensatory Stream Vegetation Mitigation, the District will preserve and protect streams and associated watersheds. Of these, preserved areas, the District will protect a total of 108 acres of riparian and adjacent upland habitat associated with a minimum of two streams that are known to support California red-legged frog and western pond turtle. All 108 acres will be located in Santa Clara County. At least one site shall be in the Santa Cruz Mountains and one site shall be in the Diablo Range. This mitigation area equals the number of impact sites with a 500-foot radius drawn around it (18 acres).	
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	California Red-Legged Frog Habitat	29.3		108-ac preserve, and 712 to 972 acres of stream and associated upland habitat as open space		N/A	10				The District has identified 6 watersheds where the program would affect red-legged frogs. To determine the area of effects to red-legged frogs, the District assessed areas of habitat (H.T. Harvey 1997). District staff determined that impacts would occur to approximately 29.3 acres of red-legged frog habitat. To compensate for these effects, the District has proposed to set aside 108 acres of watershed lands as a red-legged frog preserve. In addition, the District will protect 712 to 972 acres of stream and associated upland habitat as open space through their Stream and Watershed Protection Program. The District shall complete the purchase of the red-legged frog preserves within 5 years of the date of this opinion (July 5, 2002). The District shall not initiate new work in red-legged frog habitat in the sixth year of the permit until the property has been purchased. Within one year of the purchase of the red-legged frog preserve lands, the District shall record a Service-approved conservation easement which shall be placed on all on-site and off-site habitats set aside for the protection of red-legged frogs and their habitat in perpetuity.	
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	California Red-Legged Frog Habitat			108	56	52						This agreement expires on December 31, 2011. The mitigation area recorded as acquired was acquired at Moore Property.
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	California Red-Legged Frog Habitat	116		128	128	0					Originally, 108 ac required; increased to 128 with 20ac time lag penalty. 128 ac acquired total: 56 acres at Moore Property, 72 acres at Coyote Ridge (includes 20ac penalty from FWS)	72 acres were acquired at Coyote Ridge; original requirement was 52 acres of credit, but an additional 20-acre timelag penalty was required by the U.S. Fish and Wildlife Service
	Moore Property 2013 Monitoring Report (Year 3) for the Mitigation Area Management Plan	2013	6/4/2014	California Red-Legged Frog Habitat	29.3		56	56	0					The US Fish and Wildlife Service (USFWS) Biological Opinion (BO) No. 1-1-01-F-0314, dated July 5, 2002 for the Santa Clara Valley Water District (District), requires mitigation for impacts to 29.3 acres of California red-legged frog [CRLF (Rana aurora draytonii)] habitat from Stream Maintenance Program activities (SMP). The District holds a 57 acre Conservation Easement Deed on the Moore Property entitled “Stream and Watershed Land Preservation for Stream Maintenance Program.” (Note: 56 of the 57 acres constitute the mitigation area. One of the 57 acres constitutes existing roads and trails and is excluded from the mitigation area). This USFWS-approved Conservation Easement was recorded on 12/15/2009.	
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	Clapper Rail Habitat (Tidal Wetland)	11		30		N/A	10				The District anticipates that 11 acres of clapper rail habitat will be lost during sediment removal from tidal channels. The District will restore at least 120 acres of a 310-acre salt pond (Pond A4) to tidal marsh and credit 30 acres of this site to compensate for lost clapper rail habitat. Design and planning of this restoration will begin in 2006 .	Clapper Rail Habitat mitigation requirements overlap with Tidal Wetland mitigation requirements at Island Ponds.
	Island Ponds Mitigation Monitoring and Reporting Year 7 - 2013	2012	4/18/2014	Clapper Rail Habitat (Tidal Wetland)			30	30	0	15				No California clapper rail were detected near Pond A21 during the Refuge’s spring call-count surveys. However, one clapper rail was detected audibly further upstream within the Coyote Creek bypass channel during surveys by the District in March 2012 (~600 meters upstream of the confluence with Coyote Creek).	Clapper Rail Habitat mitigation requirements are synonymous with Tidal Wetland mitigation requirements at Island Ponds.
	Draft Environmental Impact Report and Stream Maintenance Program Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Giant Reed Control (Riparian)	78		125		N/A					Impact area: 78 ac total: 32 in Santa Clara Basin, 46 in Pajaro River Basin, and for lag time in implementing other mitigation components. Control giant reed outbreaks and provide associated mapping, revegetation, education, and coordination through county. Scheduled for 2002-2012.	Clapper Rail Habitat mitigation requirements are synonymous with Tidal Wetland mitigation requirements at Island Ponds.
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Giant Reed Control (Riparian)			125		N/A					Because the impacts are less, the Modified Pajaro River Basin (Preferred Alternative) would include the following compensatory mitigation program: restoring 30 acres of tidal wetland, creating 14 acres of freshwater wetlands, preserving and restoring 820 to 1,080 acres of stream and watershed, and control of 125 acres of giant reed. The compensatory mitigation program includes control of 66 acres of giant reed over a 1 0-year period to mitigate for the impacts to riparian vegetation. An additional 59 acres of giant reed control is proposed to compensate for any lag time between maintenance impacts to stream vegetation and implementation of the tidal wetland restoration, freshwater wetland creation, and stream and watershed protection mitigation components.	

Note: colors correspond to projects and are used to make the document easier to view

Table E-1: Database of Compensatory Mitigation Obligations and Compliance

Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP	*California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119*	2002	4/10/2014	Giant Reed Control (Riparian)	▨	▨	125		N/A		▨	▨	▨	One-half of all mitigation shall be completed by the expiration date of this Agreement.	Agreement expires on December 31, 2006.
	Army Corps o f Engineers Permit No. 22525S - Long-Term Stream Maintenance Program, Santa Clara Valley Water District, for Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act	2002	4/10/2014	Giant Reed Control (Riparian)	66	▨	125		N/A		▨	▨	▨	Mitigation Required: 59 of the total 125 acres is being provided for lag time in implementing and effective functioning of mitigation components. Control giant reed outbreaks and provide associated mapping, revegation, education, and coordination throughout county. Installation date is 2002-2012.	Impacted areas are broken down as follows: 32 acres in Santa Clara Basin and 34 acres in Pajaro River Basin Permit expires August 7, 2012. General Conditions: The time limit for completing the work authorized ends on July 15, 2012. Special Conditions: The SMP must be implemented as described in the Draft Stream Maintenance Program, dated March 2001, and in the Appendices for the Final Permit Package for the Multi-Year Stream Maintenance Program, Dated August 2001.
	California Regional Water Quality Control Board, San Francisco Bay Region, Order R2-2002-0028, Waste Discharge Requirements and Water Quality Certification for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014	Giant Reed Control (Riparian)	32	1:1	74		N/A	10	▨	▨	▨	The Giant Reed Control component will remove 32 acres of giant reed (Arundo donax), a non-native, invasive plant of riparian areas. This component also includes mapping, revegetation, monitoring, and educational elements. This component will compensate for riparian impacts resulting from vegetation management activities. Giant Reed removal will take place throughout the course of the SMP. The Discharger has proposed and by this Order is required to conduct an additional 42 acres of giant reed removal to compensate for any lag time between maintenance impacts and future implementation of SMP compensatory mitigation components.	Mitigation ratio is 1:1; 42 additional acres are for lag time for other mitigation.
	California Regional Water Quality Control Board, Central Coast Region, Issuance of Waste Discharge Requirements and Monitoring and Reporting Program Order No. RB3-2002-0008, Waste Discharge Identification No. 3430102023 for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014	Giant Reed Control (Riparian)	▨	▨	16.8		N/A	5	At Year 5, 80% survival	▨	▨	The Discharger will conduct 16.8 acres of Giant Reed Control to compensate for lag time between impacts to freshwater wetland and riparian vegetation, and implementation of mitigation components.	▨
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	Giant Reed Control (Riparian)	▨	▨	125		N/A	10	▨	▨	▨	The District will remove 125 acres of giant reed (Arundo donax) from streams and riparian areas over a period of 10 years. Areas requiring revegetation will be planted with native species. Sites will receive herbicide treatment, followed by monitoring and follow-up herbicide treatment as necessary. The District will credit 66 acres of reed removal as compensation for impacts to riparian vegetation and 59 acres to compensate for temporal losses of habitat that occurs between maintenance impacts and mitigation installation. Giant reed occurrences will be mapped.	▨
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Giant Reed Control (Riparian)	▨	▨	125	99.5	25.5		▨	▨	▨	As of October 2009, 99.5 acres mitigation credits obtained (non-basin specific)	This agreement expires on December 31, 2011.
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Giant Reed Control (Riparian)	78	▨	125	126	0		▨	▨	▨	Mitigation required and acquired is non-basin specific. Control giant reed outbreaks; map, revegetate, educate, and coordinate reed control efforts in County. Provides mitigation for riparian impacts.	▨
	Draft Stream Maintenance Program (created before Draft EIR)	no date	N/A (Online)	Giant Reed Control (Riparian)	78	▨	125	▨	N/A		▨	▨	▨	The Giant Reed Control component is proposed to compensate for impacts from vegetation management in streams to 78 acres of riparian vegetation (32 impacts in the Santa Clara Basin and 46 acres in the Pajaro River Basin). Overall, this component includes removing giant reed (Arundo donax) from 125 acres along with several other associated efforts as described above. Of the total acres from which giant reed is removed, 80 acres would be credited towards the 78 acres of impacts to riparian vegetation. An additional 45 acres of giant reed control is proposed to compensate for any lag time between maintenance impacts to stream vegetation and implementation of the other three mitigation components.	▨
	U.S. National Marine Fisheries Service, Southwest Region, Endangered Species Act Section 7 Consultation, Biological Opinion regarding the U.S. Army Corps of Engineers' proposed issuance of a 10-year Department of Army permit to the Santa Clara Valley Water District for their proposed Stream Maintenance Program	2003	4/11/2014	Large Woody Debris	▨	1:1	▨	▨	N/A		▨	▨	▨	Mitigation is for CCC Steelhead, SCCC Steelhead, and Pacific salmon habitat. Large woody debris (greater than 30 centimeters in diameter and 1 meter in length) removed from the channels of the Guadalupe River, Calero, Los Gatos, Guadapule, Alamitos, Coyote, Upper Penitencia, Stevens, San Francisquito, Bodfish, Little Arthur, Uvas and Llagas Creeks, shall be replaced at a minimum 1:1 ratio at appropriate sites within the same watershed. Appropriate sites include areas where existing habitat complexity is low and would be enhanced by the provision of complex woody debris, where habitat restoration is ongoing, and at project sites where woody debris could be incorporated as part of the structure designed.	See Table 10-4b of the SMP II Manual for a list of large woody debris mitigation sites
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Minor Work Activities (Wetland and Riparian)	▨	1:1	▨	▨	N/A		▨	▨	▨	When the annual total area of wetland and/or riparian vegetation removal done under minor work activities is greater than 0.2 acre, the District shall provide an equivalent area of mitigation. One-half of all mitigation shall be completed by the expiration date of this Agreement.	Agreement expires on December 31, 2006.
	Best Management Practices Under the Stream Maintenance Program	2002	N/A (Online)	Minor Work Activities (Wetland and Riparian)	▨	1:1	▨	▨	N/A		▨	▨	▨	BMP 0.2, Minor Work: No reporting or mitigation will be required for minor work activities which remove less than 0.01 acres of wetland and woody riparian vegetation. An equivalent area of mitigation will be provided for annual amounts greater than 0.2 acres of wetland and riparian vegetation removed by minor work activities. Individual minor work activities which affect more than 0.05 acres of wetland and woody riparian vegetation will require separate approval and mitigation. These limitations exclude those minor work activities which occur in the same area as major sediment removal and vegetation management areas included in the program as shown in Figure II-5 of the Final EIR.	▨
	California Regional Water Quality Control Board, San Francisco Bay Region, Order R2-2002-0028, Waste Discharge Requirements and Water Quality Certification for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014	Minor Work Activities (Wetland and Riparian)	▨	1:1	▨	▨	N/A	10	▨	▨	▨	Annual minor maintenance activities that impact greater than 0.2 acre of wetland or riparian habitat shall be mitigated with an equivalent area. Impacts shall be excluded in areas that have already been accounted for under the original SMP impact projection for sediment removal and vegetation management.	▨
	Draft Environmental Impact Report and Stream Maintenance Program Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Nontidal Wetland	▨	1:1	14	▨	N/A		▨	▨	▨	14 ac acquired total (10 in Santa Clara Basin, 4 in Pajaro River Basin): 3 at Los Capitancillos (for impacts to Santa Clara Basin), 7 at Coyote Lakes Park Site 10A (for impacts to Santa Clara Basin), 4 at Church Pond No. 2 (for impacts to Pajaro River Basin) Mitigation Component: Freshwater Wetland Creation located at Los Capitancillos [along Guadalupe Creek in the Santa Clara Basin], Coyote Lakes Park Site 10A [along Coyote Creek in the Santa Clara Basin], and Church Pond No. 2 [along Llagas Creek in the Pajaro River Basin]. Los Capitancillos: convert annual grasslands to seasonal or perennial wetlands adjacent to Guadalupe River (2002). Coyote Lakes Park Site 10A: convert ruderal grasslands to near-perennial wetlands adjacent to Coyote Creek (no date yet). Church Pond No. 2: convert open water in inactive percolation pond to wetland bench (2003).	Freshwater Wetland Creation/Restoration component
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Nontidal Wetland	106	▨	14	▨	N/A		▨	▨	▨	Because the impacts are less, the Modified Pajaro River Basin (Preferred Alternative) would include the following compensatory mitigation program: restoring 30 acres of tidal wetland, creating 14 acres of freshwater wetlands, preserving and restoring 820 to 1,080 acres of stream and watershed, and control of 125 acres of giant reed.	Freshwater Wetland Creation/Restoration component
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Nontidal Wetland	66	▨	820 to 1,080	▨	N/A		▨	▨	▨	Because the impacts are less, the Modified Pajaro River Basin (Preferred Alternative) would include the following compensatory mitigation program: restoring 30 acres of tidal wetland, creating 14 acres of freshwater wetlands, preserving and restoring 820 to 1,080 acres of stream and watershed, and control of 125 acres of giant reed.	Stream and Watershed Protection component

Note: colors correspond to projects and are used to make the document easier to view

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Table E-1: Database of Compensatory Mitigation Obligations and Compliance

Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP	*California Regional Water Quality Control Board, San Francisco Bay Region, Order R2-2002-0028, Waste Discharge Requirements and Water Quality Certification for Santa Clara Valley Water District Multi-Year Stream Maintenance Program*	2001	9/10/2014	Nontidal Wetland	91	▨	820 to 1,080	▨	N/A		▨	▨	▨	The Discharger shall implement the Final Environmental Impact Report for the Multi- Year Stream Maintenance Program Appendix J, Mitigation Monitoring and Reporting Program (Appendix B) dated August 2001.	Stream and Watershed Protection component
	Draft Environmental Impact Report and Stream Maintenance Program Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Nontidal Wetland	102	▨	920 to 1,210	▨	N/A		▨	▨	▨	Impact area: 102 ac total:74 in Santa Clara Basin streams, 21 in Pajaro River Basin streams, 7 in canals. Preserve, protect, and improve streams and associated wetlands. Located within undeveloped parcels with streams. Scheduled as lands become available in first 10 years.	▨
	California Regional Water Quality Control Board, San Francisco Bay Region, Order R2-2002-0028, Waste Discharge Requirements and Water Quality Certification for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014	Nontidal Wetland	91	▨	14	▨	N/A	10	▨	▨	▨	The Discharger shall implement the Final Environmental Impact Report for the Multi- Year Stream Maintenance Program Appendix J, Mitigation Monitoring and Reporting Program (Appendix B) dated August 2001.	Freshwater Wetland Creation/Restoration Component
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Nontidal Wetland	14	1:1	14	▨	N/A	▨	▨	▨	▨	One-half of all mitigation shall be completed by the expiration date of this Agreement.	Freshwater Wetland Creation/Restoration component Agreement expires on December 31, 2006.
	Army Corps o f Engineers Permit No. 22525S - Long-Term Stream Maintenance Program, Santa Clara Valley Water District, for Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act	2002	4/10/2014	Nontidal Wetland	▨	▨	14	▨	N/A	▨	▨	▨	▨	14 ac acquired total (10 in Santa Clara Basin, 4 in Pajaro River Basin): 3 at Los Capitancillos (for impacts to Santa Clara Basin), 7 at Coyote Lakes Park Site 10A (for impacts to Santa Clara Basin), 4 at Church Pond No. 2 (for impacts to Pajaro River Basin) The SMP must be implemented as described in the Draft Stream Maintenance Program, dated March 2001, and in the Appendices for the Final Permit Package for the Multi-Year Stream Maintenance Program, Dated August 2001.	Freshwater Wetland Creation/Restoration component Permit expires August 7, 2012. The time limit for completing the work authorized ends on July 15, 2012.
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Nontidal Wetland	▨	▨	820 to 1,080	▨	N/A	▨	▨	▨	▨	One-half of all mitigation shall be completed by the expiration date of this Agreement.	Stream and Watershed Protection component
	Army Corps o f Engineers Permit No. 22525S - Long-Term Stream Maintenance Program, Santa Clara Valley Water District, for Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act	2002	4/10/2014	Nontidal Wetland	92	▨	Approx. 820 to 1,080 ac purchased and additional restored	▨	N/A	▨	▨	▨	▨	Installation date is as lands become available in first 10 years. The SMP must be implemented as described in the Draft Stream Maintenance Program, dated March 2001, and in the Appendices for the Final Permit Package for the Multi-Year Stream Maintenance Program, Dated August 2001.	Stream and Watershed Protection component
	California Regional Water Quality Control Board, San Francisco Bay Region, Water Quality Certification for Coyote Parkway Freshwater Wetland Project	2006	5/2/2014	Nontidal Wetland	▨	▨	7	▨	N/A	▨	▨	▨	▨	The Project is intended to fulfill 7.6 acres of a 10 acre freshwater wetland creation commitment to mitigate for freshwater wetland impacts from the District's Multi-Year Stream Maintenance Program (SMP) approved by the San Francisco Bay Regional Water Quality Control Board (Water Board) Order R2-2002-0028, dated February 27, 2002. The Project is one of several mitigation projects included in the SMP...The channels will support approximately 1 .0 acre of open water habitat and 1.9 acres of near-perennial wetland vegetation surrounded by approximately 5.7 acres of seasonal wetland vegetation. One or two islands will be constructed between the channels for upland habitat.	Freshwater Wetland Creation/Restoration component. Only fulfilled 7 acres of requirement. Total site is 12 acres.
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Nontidal Wetland	▨	1:1	14	11	3	▨	▨	▨	▨	Required Mitigation: 10ac in Santa Clara Basin, 4 acres in Pajaro Basin. As of October 2009, 7 acres of mitigation credits obtained in Santa Clara Basin (deficit 3 acres); 5 acres of mitigation credits obtained in Pajaro Basin (surplus 1 acre)	Freshwater Wetland Creation/Restoration component This agreement expires on December 31, 2011.
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Nontidal Wetland	▨	10:1 and 15:1	92	20	72	▨	▨	▨	▨	92 ac of mitigation credit required (820-1,080 acres). As of October 2009, Under the Stream and Watershed Land Preservation Program (S&WP): 10 acres of mitigation credits (125 ac) obtained in Santa Clara Basin (deficit 71 acres of mitigation credits); 10 acres of mitigation credits (138 ac) obtained in Pajaro Basin (deficit 1 acre of mitigation credits)	Stream and Watershed Protection component This agreement expires on December 31, 2011.
	Coyote Parkway Freshwater Wetland Fifth Annual Monitoring Report Calendar Year 5 (2011)	2012	6/4/2014	Nontidal Wetland	▨	▨	7	7.5	0	5	35% for seasonal wetland, >50% for near perennial wetland, 80% for willow forest, at least 7 ac meets USACE (1987) wetland criteria	72% for seasonal wetland, 100% for near perennial wetland, 84% for willow forest, 7.5 ac met wetland criteria	Yes	The mitigation goal of the Project is to provide at least 7 acres of freshwater wetland for the SMP.	Freshwater Wetland Creation/Restoration component (fulfills requirement for Santa Clara Basin)
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Nontidal Wetland	14	1:1	14	11	3	▨	▨	▨	▨	14 ac acquired total (10 in Santa Clara Basin, 4 in Pajaro River Basin). 7 ac acquired in Santa Clara Basin, 4.65 ac acquired in Pajaro Basin Convert or restore areas to seasonal or perennial wetlands. Provides mitigation for non-tidal wetland impacts.	Freshwater Wetland Creation/Restoration component
	Pajaro Basin Freshwater Wetland Fifth Annual Monitoring Report Calendar Year 5 (2012)	2013	6/4/2014	Nontidal Wetland	▨	▨	4	4	▨	5	▨	▨	▨	The remaining 5.3 acres of the site, including the remaining 3.7 acres of jurisdictional wetland, is presently unallocated to mitigation, and available for use by other projects.	Freshwater Wetland Creation/Restoration component
	Stevens Canyon Ranch Riparian Conservation Easement 2013 Monitoring Report	2013	6/4/2014	Nontidal Wetland	▨	▨	69	69	▨		▨	▨	▨		Stream and Watershed Protection Component
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Nontidal Wetland	116	▨	11	11	▨		▨	▨	▨	Mitigation Required: For Stream and Watershed Protection, 11 credits (138 ac) for Pajaro Basin. Mitigation acquired: 10.7 ac credit (138 ac total) for Pajaro Basin plus 0.3 addition acres of wetland created in Pajaro Basin (nested under nontidal wetland creation requirement where they acquired 0.65ac over the requirement). Breakdown of mitigation sites: 0.3 ac credit at Pajaro Freshwater Wetland and 10.7 ac credit at Carnadero Preserve	Stream and Watershed Protection component 116 ac impact area is the total impact area in both Santa Clara River and Pajaro Basins
	Pajaro Basin Freshwater Wetland Fifth Annual Monitoring Report Calendar Year 5 (2012)	2013	6/4/2014	Nontidal Wetland	▨	▨	0.7	0.7	▨	5	▨	▨	▨	0.7 ac credit is equivalent to 4.5 acres. The remaining 5.3 acres of the site, including the remaining 3.7 acres of jurisdictional wetland, is presently unallocated to mitigation, and available for use by other projects. For information regarding the method of determining the required size of the Pajaro Basin SMP mitigation area, see the 2009 monitoring report. This method indicated that the designated SMP wetland mitigation area should be 4.65 acres. In addition to this method, the required acreage was "back-calculated" based on the total amount of acreage remaining in the Carnadero Preserve S&WP buffers after excluding the wetland project area (so as not to double count any areas). This method indicated that the Carnadero buffers provide 10.33 credits, and that the Pajaro Basin Wetland should therefore provide 4.67 acres (credits) in order to achieve the required total of 15 credits of wetland mitigation for the SMP in the Pajaro Basin. The numbers, for crediting purposes, have been rounded to the nearest 10th; for 4.7 and 10.3 credits in the wetland and S&WP projects, respectively.	Stream and Watershed Protection component The 2002 SMP required 15 wetland mitigation credits total (for both Stream and Watershed Protection & Freshwater Wetland Creation/Restoration components) in the Pajaro Basin.
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Nontidal Wetland	116	▨	81	10	71		▨	▨	▨	Mitigation Required: 81 credits (820-1080ac) for Santa Clara Basin Mitigation acquired: 10 ac credit (125 ac total) for Santa Clara Basin (will increase to 69 credits achieved with Coyote Ridge, Hendrys Creek, Upper Penitencia). 15 additional acres will be provided by SCVWD. Breakdown of mitigation sites: 7 ac credit at Coyote Parkway Freshwater Wetland, 5.43 ac credit at Stevens Canyon Ranch, 4.51 ac credit at Moore Property, 34.7 ac credit at Coyote Ridge, 8.4 ac credit at Hendry's Creek, 16 ac credit at Upper Penitencia Creek (Kammerer)	Stream and Watershed Protection component. 116 ac impact area is the total impact area in both Santa Clara River and Pajaro Basins

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Appendix E: Database of Compensatory Mitigation Obligations and Compliance

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Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP	*Carnadero Preserve Stream and Watershed Protection Project Sixth Annual Management Plan Monitoring Report, Calendar Year 6 (2013)*	2014	6/4/2014	Nontidal Wetland	▨	▨	10.3	10.3	0	10	▨	▨	▨	The S&WP buffers comprised 138 acres of land, originally equating to a total of 10.7 of the 11 projected S&WP mitigation credits in the Pajaro Basin (SCVWD 2007). The remaining 0.3 credits were to be supplied by the Pajaro Basin Wetland Project. The Pajaro Basin Wetland Project, subsequently constructed within the Carnadero Preserve S&WP buffers (Figure 5), also provides SMP1 wetland mitigation credit. In order to avoid double counting credit for SMP wetlands mitigation in the same footprint, the portion of the Pajaro Basin Wetland Project that provides SMP1 credit (4.67 acres) for the SMP was removed from the calculation of S&WP SMP acreage and credit. This resulted in only 133.5 acres of S&WP buffers (rather than 138) and 10.33 S&WP credits on the Carnadero Preserve (rather than 10.7). The Carnadero Preserve S&WP credit breakdown is: 43 acres within 150 ft buffers at 10:1 credit = 4.3 credits; 90.5 acres within 500 ft buffers at 15:1 credit = 6.03 credits for a total of 10.33 credits. This number was rounded down to 10.3, with the remaining 4.7 SMP1 mitigation credits for wetlands in the Pajaro Basin then provided by the Pajaro Basin Wetlands Project (also described in SCVWD 2013, Pajaro Basin Wetlands monitoring report).	Stream and Watershed Protection component The District purchased 198 acres of the 478-acre property for the purpose of the S&WP Program and for additional future wetland and riparian mitigation and enhancement potential in 2003 (Figure 2). The 2002 SMP required 15 wetland mitigation credits total (for both Stream and Watershed Protection & Freshwater Wetland Creation/Restoration components) in the Pajaro Basin.
	Draft Stream Maintenance Program (created before Draft EIR)	no date	N/A (Online)	Nontidal Wetland	14	1:1	14	▨	N/A	▨	▨	▨	▨	The Freshwater Wetland Creation component is proposed for compensation of 14 acres of freshwater wetland impacts in stream channels. The District would create 14 acres of freshwater wetlands (also known as nontidal wetlands) at locations near streams in the Santa Clara (10 acres) and Pajaro River (4 acres) Basins.	Freshwater Wetland Creation/Restoration component
	Draft Stream Maintenance Program (created before Draft EIR)	no date	N/A (Online)	Nontidal Wetland	116	10:1 or 15:1	920 to 1,210	▨	N/A	▨	▨	▨	▨	Impact area: 116 ac total: 74 in the Santa Clara Basin and 21 in the Pajaro River Basin. The Freshwater Wetland Creation component and the Stream and Watershed Protection component (described in next section) are proposed to compensate for impacts to 116 acres of freshwater wetlands (109 acres of impacts from work in freshwater stream channels and 7 acres of impacts from work in canals). Under the Stream and Watershed Protection component, the District would purchase approximately 920 to 1,210 acres of land and conservation easements to preserve, protect, and improve streams and their associated watersheds in the county...Acquisition will provide 92 acres of mitigation credits; and restoration and management on selected parcels will provide 10 acres of credit. The relative contribution of these subcomponents could be adjusted based on opportunity and resource needs identified as the mitigation component progresses...Credit for acquisition will be given at a 10:1 or 15:1 ratio (acquisition acreage : impact acreage) for acquisition of lands that both contain and are directly adjacent to stream resources as described below. The crediting method ensures that a substantial amount of stream and associated riparian corridor will be acquired, that immediately adjacent uplands which directly affect stream condition will also be acquired, and that the District's financial contribution will be large enough to enable purchase of appropriate parcels. 10:1 ratio--Up to 50 feet from the centerline of first order streams and 150 feet from the centerline of second order and greater streams, and 15:1 ratio--For an additional area from 150 up to 500 feet from the centerline of second order and greater streams.	Stream and Watershed Protection component
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	10	▨	N/A	▨	▨	▨	▨	One-half of all mitigation shall be completed by the expiration date of this Agreement.	Agreement expires on December 31, 2006.
	Army Corps o f Engineers Permit No. 22525S - Long-Term Stream Maintenance Program, Santa Clara Valley Water District, for Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act	2002	4/10/2014	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	Approx. 100 miles, up to 10 ac	▨	N/A	▨	▨	▨	▨	Compensates for lag time in implementing and effective functioning of Pond A4 tidal wetland restoration. Control smooth cordgrass; mapping, education, regional coordination. Installation date is 2002-2007	Permit expires August 7, 2012. General Conditions: The time limit for completing the work authorized ends on July 15, 2012. Special Conditions: The SMP must be implemented as described in the Draft Stream Maintenance Program, dated March 2001, and in the Appendices for the Final Permit Package for the Multi-Year Stream Maintenance Program, Dated August 2001.
	U.S. Fish and Wildlife Service Formal Endangered Species Consultation on the Santa Clara Valley Water District Ten-Year Maintenance Permit, PN 22525S	2002	4/10/2014	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	▨	▨	N/A	10	▨	▨	▨	To reduce the temporal effects of tidal habitat loss, the District shall implement a control program to eliminate the exotic species Spartina alterniflora, beginning in 2003, the District shall not conduct any work in tidal channels until the plan has been finalized. Implementation of the Spartina control program shall be completed in 2010.	
	Smooth Cordgrass Control Program Annual Monitoring Report Year 3 - 2005	2006	N/A (Online)	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	10	8.7	1.3	10	▨	▨	▨		Performance and Success Criteria for the Program: 1. A baseline inventory of existing stands of smooth cordgrass within the entire program area completed by year 2 (2004) 2. Initial control efforts of existing stands identified in year 1 to begin by year 2 (2004) 3. Infestations will be treated within 1 year of identification 4. Ongoing up-date monitoring and mapping of distribution and extent of selected areas in years 3, 4, and 5 (2005-2007) 5. Treatment of all clones, up to 10 acres, initiated by year 6 (2008) 6. Treated clones to be successfully controlled by year 8 (2010)
	Smooth Cordgrass Control Program Annual Monitoring Report Year 5 - 2007	2008	6/18/2014	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	10	18.9	0.0	10	▨	▨	▨	In total, 18.9 acres were treated in the program area in 2006...Based on both the District's and the ISP's 2007 survey efforts, the total infestation in the program area is currently estimated to be 13 acres spread amongst 286 separate patches (Table 1). This is a 31% decrease in acreage from 2006 to 2007.	Performance and Success Criteria for the Program: 1. A baseline inventory of existing stands of smooth cordgrass within the entire program area completed by year 2 (2004) 2. Initial control efforts of existing stands identified in year 1 to begin by year 2 (2004) 3. Infestations will be treated within 1 year of identification 4. Ongoing up-date monitoring and mapping of distribution and extent of selected areas in years 3, 4, and 5 (2005-2007) 5. Treatment of all clones, up to 10 acres, initiated by year 6 (2008) 6. Treated clones to be successfully controlled by year 8 (2010)
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Smooth Cordgrass Control (Tidal Wetland)	▨	▨	10	10	0	▨	▨	▨	▨	Mitigation Required is 100 miles of monitoring and up to 10 acres of removal. As of October 2009, 10 acres of mitigation credits obtained (non-basin specific) (one more year of clone treatment required in December 2010)	This agreement expires on December 31, 2011.
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Smooth Cordgrass Control (Tidal Wetland)	30	N/A	10	10	0	▨	▨	▨	▨	Mitigation required is up to 10 acres in tidal wetlands. Control invasive cordgrass along tidal shorelines. Provides mitigation for time lag until tidal wetland mitigation is established.	▨
	Army Corps of Engineers Nationwide Permits 31 & 33, File Number 26274S - Adobe Creek at Highway 101	2001	5/2/2014	Tidal Wetland	0.01	1:1	0.01	▨	N/A	▨	▨	▨	▨	In association with the one-time-only mitigation policy for the proposed SCVWD Long-Term Maintenance Program permit, 0.01 acre of tidal habitat temporarily lost for this project will be compensated for at Cargill Pond A-4.	▨
	Army Corps of Engineers Permit No. 26277S - Calabazas Creek downstream of Highway 101	2001	5/2/2014	Tidal Wetland	0.27	1:1	0.27	▨	N/A	▨	▨	▨	▨	In keeping with the one-time-only mitigation policy associated with the proposed SCVWD Long-Term Maintenance Program permit, compensation for the temporary loss of 0.27 acre of tidal wetlands for this project will be at Cargill Pond A-4.	▨
	Draft Environmental Impact Report and Stream Maintenance Program Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Tidal Wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	Impact area: 30 ac total: 29 from sediment removal, 1 from vegetation management. Mitigation Component: Tidal Wetland Restoration located at Cargill Pond A-4. Restore dike salt evaporator pond to historical tidal marsh conditions (2006).	▨
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Tidal Wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	Because the impacts are less, the Modified Pajaro River Basin (Preferred Alternative) would include the following compensatory mitigation program: restoring 30 acres of tidal wetland, creating 14 acres of freshwater wetlands, preserving and restoring 820 to 1,080 acres of stream and watershed, and control of 125 acres of giant reed.	▨
	California Department of Fish and Game Central Coast Region 1601 Lake and Streambed Alteration Agreement Notification Number R3-2001-0119	2002	4/10/2014	Tidal Wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	One-half of all mitigation shall be completed by the expiration date of this Agreement.	Agreement expires on December 31, 2006.

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Appendix E: Database of Compensatory Mitigation Obligations and Compliance

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Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP	*Army Corps o f Engineers Permit No. 22525S - Long-Term Stream Maintenance Program, Santa Clara Valley Water District, for Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act*	2002	4/10/2014	Tidal Wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	Restore dike salt evaporator pond to historical tidal marsh conditions. Will provide foraging habitat for California clapper rail and black rail. Installation date is 2007.	Impacted areas are broken down as follows: 29 from sediment removal, 1 from vegetation management Permit expires August 7, 2012. General Conditions: The time limit for completing the work authorized ends on July 15, 2012. Special Conditions: The SMP must be implemented as described in the Draft Stream Maintenance Program, dated March 2001, and in the Appendices for the Final Permit Package for the Multi-Year Stream Maintenance Program, Dated August 2001.
	California Regional Water Quality Control Board, San Francisco Bay Region, Order R2-2002-0028, Waste Discharge Requirements and Water Quality Certification for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014	Tidal Wetland	30	1:1	30	▨	N/A	10	▨	▨	▨	The Tidal Wetland Restoration component involves the restoration of 30 acres of tidal wetlands at an existing salt pond (formerly Cargill Salt Pond A4) located along South San Francisco Bay. This component will compensate for impacts to tidal wetlands resulting from sediment removal and vegetation management activities. Restoration is expected to begin at this site in 2007.	Sediment Removal impacts account for 29 acres of impact. Vegetation Management impacts account for 1 acre of impact.
	San Francisco Bay Conservation and Development Commission Permit No. M77-113, Amendment No. Three	2005	6/4/2014	Tidal Wetland	▨	▨	▨	▨	N/A	10	80%	▨	▨	Prior to May 5, 2007, to mitigate for impacts associated with the ongoing maintenance activities authorized herein, the permittee shall submit plans, receive Commission authorization, and complete the restoration of 30 acres of a diked salt-evaporator pond in the south Bay (Pond A4) to historic tidal marsh conditions. In the event that Pond A4 is not available for this restoration, the permittee shall receive Commission authorization for and complete an equivalent mitigation project by May 5, 2009, which may include Ponds 19, 20, and 21 (the Island Ponds). Every other year, starting July 1 of the year following project completion, for a ten-year period, or until those portions of the restoration site subject to tidal action are approximately 80% vegetated, whichever occurs first, the permittee shall report to the Commission on the effects of the project in restoring tidal marsh and transitional habitat at the restoration site.	Original permit is dated February 9, 1978. Permit expires May 5, 2010.
	Addendum to the Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2006	N/A (Online)	Tidal Wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	The removal of 30 acres of tidal wetlands over the 20-year SMP period is a continuation of previous practices. The compensatory mitigation program includes restoration of 30 acres of tidal wetlands at a location either directly adjacent to or no farther than 7 miles from the tidal wetland impact areas. The restoration site is expected to support permanent tidal wetland similar to or of higher quality than the tidal wetland temporarily impacted by repetitive maintenance activities. Guiding principles were established with the advice of the stakeholders and regulatory agencies to assist in development of the mitigation elements. Some of these guiding principles include: mitigation will match impacts by basin; and larger, sustainable sites are preferable to smaller, fragmented sites.	▨
	Addendum to the Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2006	N/A (Online)	Tidal wetland	30	1:1	30	▨	N/A	▨	▨	▨	▨	Existing Mitigation Commitment: 1:1 compensation ratio applies to 30 acres (29 ac from sediment removal, 1 ac from vegetation management) at Pond A4. Mitigation area will provide foraging habitat for California clapper rail and black rail. Proposed Mitigation Commitment: 1:1 compensation ratio applies to 30 acres (29 ac from sediment removal, 1 ac from vegetation management) at Islands Ponds A19, A20 and A21. Mitigation area will provide foraging habitat for California	▨
	San Francisco Bay Conservation and Development Commission Permit No. M77-113, Amendment No. Four	2010	4/10/2014	Tidal Wetland	30	1:1	30	▨	N/A	10	80%	▨	▨	Prior to May 5, 2007, to mitigate for impacts associated with the ongoing maintenance activities authorized herein, the permittee shall submit plans, receive Commission authorization, and complete the restoration of 30 acres of a diked salt-evaporator pond in the south Bay (Pond A4) to historic tidal marsh conditions. In the event that Pond A4 is not available for this restoration, the permittee shall receive Commission authorization for and complete an equivalent mitigation project by May 5, 2009, which may include Ponds 19, 20, and 21 (the Island Ponds). Following the issuance of Amendment No. Three, the permittee determined that they would contribute to the restoration of Ponds A19, A20 and A21 (Island Ponds) rather than restore Pond A4. The Island Ponds were returned to tidal action on March 2006 with the permittee's assistance (Amendment No. Four). Every other year, starting July 1 of the year following project completion, for a ten-year period, or until those portions of the restoration site subject to tidal action are approximately 80% vegetated, whichever occurs first, the permittee shall report to the Commission on the effects of the project in restoring tidal marsh and transitional habitat at the restoration site.	Original permit is dated February 9, 1978. Permit expires May 5, 2015.
	California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2009-0361-R3	2010	5/2/2014	Tidal Wetland	30	1:1	30	30	0	▨	▨	▨	▨	As of October 2009, 30 acres of mitigation credits obtained in Santa Clara Basin	This agreement expires on December 31, 2011.
	Island Ponds Mitigation Monitoring and Reporting Year 7 - 2012	2012		Tidal Wetland	30	1:1	30	30	0	15	75% native vegetation cover	54%	N	On average there is 54% total native vegetative cover in patches that are larger than 2 acres in size. The vegetation growing adjacent to the borrow ditch in Pond A21 had a higher percent cover than the vegetation growing on the pond surface. This is likely due to the fact that the vegetation adjacent to the borrow ditch established first and has had a couple more years to develop than the newer vegetation growing on the pond's surface. Pond A20 has the highest total vegetative cover of the Ponds with a 76% average, while Pond A19 had the lowest at 28% cover. Pond A21 was in the middle with 70% total vegetative cover (Table 3-2).	The performance criteria for the SMP mitigation are: a. Restore 30 acres of vegetated tidal marsh located within a larger marsh area on the three Island Ponds, b. Vegetation covers no less than 75% of the 30 acres, c. Plant species composition consists of native tidal marsh species appropriate to the salinity regime, d. Presence of California clapper rail at the Island Ponds as detected by a positive response to rail call counts using USFWS Endangered Species Office approved survey protocols. (This performance criterion for the clapper rail mitigation requirement was established by the District through negotiations with the USFWS Endangered Species Office in December 2005.) e. Targets achieved within 15 years following levee breach.
	2014-2023 Stream Maintenance Program Manual	2013	4/18/2014	Tidal Wetland	30	1:1	30	30	0	▨	▨	▨	▨	Restore salt ponds to tidal marsh conditions. Provides mitigation for tidal wetland/species impacts.	
	Draft Stream Maintenance Program (created before Draft EIR)	no date	N/A (Online)	Tidal Wetland	30	1:1	30		N/A	▨	▨	▨	▨	The tidal wetland restoration component is proposed to compensate for impacts to 30 acres of tidal wetlands in the Santa Clara Basin (29 acres of impacts from sediment removal and 1 acre of impact from channel vegetation management).	
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2001	N/A (Online)	Vegetation	▨	3:1	▨	▨	N/A	▨	▨	▨	▨	BMP 2.8, Replace Trees: The District shall replace trees as follows: 1. Native trees between 8 and 18 inches in diameter at breast height (dbh) that are lost due to bank protection impacts will be replaced at a ratio of 3:1. 2. Trees removed for installation of bank protection measures shall be replaced at the site, if feasible, or at the mitigation site created for that bank protection activity.	The 3:1 requirement came from CDFG: "As a point of clarification, the Department requires a mitigation ratio of 3:1 for riparian impacts, regardless of the tree diameter at breast height. If a project is small, then the 3:1 ratio is applied based on the number of trees impacted- If the project is large, then the 3:1 ratio is applied based on the area of impact." (CDFW 2001, Response to Draft EIR)
	Final Environmental Impact Report for the Multi-Year Stream Maintenance Program	2002	N/A (Online)	Vegetation	▨	1:1	▨	▨	N/A	▨	▨	▨	▨	BMP 2.8, Replace Trees: The District shall replace trees as follows: 1. Non-native trees between 6 and 18 inches dbh will be replaced at a ratio of 1:1 with appropriate native species. 2. Trees removed for installation of bank protection measures shall be replaced at the site, if feasible, or at the mitigation site created for that bank protection activity.	
	California Department of Fish and Game, Central Coast Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2006-0067-3	2006	5/2/2014	Vegetation	▨	3:1	▨	▨	N/A	▨	▨	▨	▨	Any oak trees that are lost will be replaced on site at a 3:1 ratio.	Agreement is for Coyote Parkway Freshwater Wetland Project. The agreement expires December 31, 2009.
	California Department of Fish and Game, Central Coast Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2006-0067-3	2006	5/2/2014	Vegetation	▨	1:1	▨	▨	N/A	▨	▨	▨	▨	Native riparian vegetation that is temporarily impacted due to outlet construction shall be replaced on site.	Agreement is for Coyote Parkway Freshwater Wetland Project. The agreement expires December 31, 2009.

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SMP	*California Department of Fish and Game, Bay Delta Region, 1602 Lake and Streambed Alteration Agreement, Notification Number 1600-2007-1072-3*	2007	5/2/2014	Vegetation		3:1			N/A					Native riparian vegetation that is temporarily impacted shall be replaced on site at a ratio of 3:1.	Agreement is for Pajaro Basin Freshwater Wetland Project...The District proposes to provide approximately 9 acres of seasonal wetland habitat to fulfill mitigation requirements for the District's Stream Maintenance Program and other mitigation needs. This agreement expires on December 31, 2011.
	California Regional Water Quality Control Board, Central Coast Region, Issuance of Waste Discharge Requirements and Monitoring and Reporting Program Order No. RB3-2002-0008, Waste Discharge Identification No. 3430102023 for Santa Clara Valley Water District Multi-Year Stream Maintenance Program	2002	4/10/2014		49				N/A	5	At Year 5, 80% survival			Discharger shall implement compensatory mitigation for impacts due to sediment removal and vegetation management in accordance with: a. This Order (including "Attachment C"), b. The Draft Stream Maintenance Program (dated March 2001), and c. The Final Environmental Impact Report (dated August 2001). By November 1, 2007, at least 50% of compensatory mitigation (for sediment removal and vegetation management impacts) shall be installed. Compensatory mitigation with revegetation must have at least 80% survival five years after planting and two years after supplemental watering is discontinued. Regional Board staff may consider other success criteria on a case-by-case basis. The Discharger shall monitor all revegetated sites annually for at least five years after planting, and for at least two years after supplemental watering is discontinued to determine if supplemental watering, weed control, rodent control, and/or protection from vandalism are required to encourage plant establishment.	All impacts are from vegetation management
SMP 1997	*Army Corps of Engineers Permit No. 22038S - Tidal - San Francisquito Creek, Lower Penitencia Creek, San Tomas Aquino Creek (Agnew Rd. to Hwy. 237), and Berryessa Creek. Non-Tidal - Saratoga Creek, San Tomas Aquino Creek (upstream of Hwy. 101), Los Coches Creek, Calera Creek, and Stevens Creek*	1997	5/2/2014	Nontidal Wetland	0.6	1:1	0.6		N/A					If no freshwater mitigation plan has been approved by the Corps, by May 8, 1998, SCVWD shall submit an alternative mitigation plan to the Corps which provides for functions and values at least equivalent to 0.6 acre of impacted freshwater habitat.	The permit expires August 31, 2000.
SMP 1998	*1998 Stream Maintenance Project Final Initial Study and Negative Declaration*	1998	4/9/2014	Tidal Wetland		1/4:1			N/A					The design features of the project-- including the best management practices (BMPs) and the 1/4 acre of restored tidal habitat for every 1 acre tidal wetland habitat impacted-- directly incorporated into the project description either avoid significant effects or will mitigate the effects to a point of less-than-insignificance.	Sediment removal will occur at the following locations: Permanente Creek, Charleston Road to Highway 101 (Mountain View) Regnart Creek, Blaney Ave. to Kim St. (Cupertino) Sunnyvale East, dis Highway 237 to Sta 23+00 Guadalupe Slough (Sunnyvale) Berryessa Creek, confluence with Lower Penitencia Creek to Calaveras Blvd. (Milpitas) Berryessa Creek, Montague Expressway to 1-680 (San Jose) Berryessa Creek, Sierra Creek to Cropley Ave. (San Jose) Erosion repairs will occur at the following waterways: Permanente Creek, dis Highway 101 (Mountain View) Stevens Creek, dis Homestead Rd. (Sunnyvale Cupertino) Regnart Creek, u/s Blaney Ave. (Cupertino) Saratoga Creek, d/s Via Monte Dr. (Saratoga) Alamitos Creek, d/s Mazzone Dr. (San Jose) Los Gatos Creek, u/s Leigh Ave.(San Jose) Los Gatos Creek, u/s Meridian Ave. (San Jose) Ross Creek, u/s Camino def Cerro (Los Gatos) Berryessa Creek, at confluence with Lower Penitencia Creek to Calaveras Blvd. (Milpitas) Lower Silver Creek, u/s Capitol Expressway (San Jose) Lower Silver Creek, d/s San Antonio St. (San Jose) Lower Silver Creek, d/s Story Rd. (San Jose) Lower Silver Creek, u/s Story Rd. (San Jose) Sierra Creek, Mauna Kea Ln. to Crater Ln. (San Jose) Lower Llagas Creek, Buena Vista Ave. to Leavesley Rd. (Gilroy)
SMP 2000	*2000 Stream Maintenance Project Final Initial Study and Mitigated Negative Declaration*	2000	4/9/2014	Nontidal Wetland	1.91	1:1	1.91		N/A					The 2000 SMP will result in removal of 0.79 acres of tidal wetland vegetation and 1.91 acres of nontidal vegetation, which will be mitigated by wetland restoration at a 1:1 ratio at the Cargill Tidal Mitigation Project Site for tidal wetlands and Los Capitancillos Freshwater Mitigation Project site for nontidal wetlands.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Water Quality Certification (401 Certification) for Santa Clara Valley Water District 2000 Stream Maintenance Project, Stream Bank Stabilization Projects	2000	5/2/2014	Nontidal Wetland	0.03	1:1	0.03		N/A					Mitigation for the loss of wetland habitat associated with the streambank stabilization will be 0.03 acres of non-tidal wetland at the Los Capitancillos Freshwater Wetlands Mitigation Site.	
	2000 Stream Maintenance Project Final Initial Study and Mitigated Negative Declaration	2000	4/9/2014	Tidal Wetland	0.79	1:1	0.79		N/A					The 2000 SMP will result in removal of 0.79 acres of tidal wetland vegetation and 1.91 acres of nontidal vegetation, which will be mitigated by wetland restoration at a 1:1 ratio at the Cargill Tidal Mitigation Project Site for tidal wetlands and Los Capitancillos Freshwater Mitigation Project site for nontidal wetlands.	Sediment removal will occur at the following locations: San Francisquito Creek-d/s (downstream) Highway 101 (Palo Alto) Stevens Creek-L' Avenida Avenue to Crittenden Lane (Mountain View) San Tomas Aquino Creek-Highway IOI to Scott Boulevard (Santa Clara) Saratoga Creek-u/s (upstream) San Tomas Creek to u/s Cabrillo A venue (Santa Clara) Sunnyvale East-u/s Guadalupe Slough to u/s of the Pedestrian Bridge and at Caribbean Drive Bridge (Sunnyvale) Guadalupe River-u/s Virginia Street (San Jose) Calera Creek-North Milpitas Boulevard to u/s Arizona Drive (Milpitas) Lower Silver Creek-South Babb Creek to dis Murtha Drive (San Jose) Miguelita Creek-u/s Fairway Drive (San Jose) Piedmont Creek-u/s Vista Way (Milpitas) Bank stabilization will occur at the following locations: Permanente Creek-u/s Cuesta Drive (Mountain View) Prospect Creek-u/s Prospect Road Bridge (Cupertino/Saratoga) Saratoga Creek-u/s Prospect Road at Lynbrook Court (Saratoga) Alamitos Creek-at Pedestrian Bridge (San Jose) Alamitos Creek-u/s Graystone Lane Bridge (San Jose) Guadalupe River-two sites: one u/s Virginia Street and one dis of Virginia Street (San Jose) Los Gatos Creek-u/s Campbell Avenue (Campbell) Los Gatos Creek-at Vasona Dam (Los Gatos) Lower Silver Creek-South Babb Creek to dis Murtha Drive (San Jose) Piedmont Creek-u/s Vista Way (Milpitas) Upper Penitencia Creek--d/s Noble Avenue (San Jose)

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SMP 2001	*2001 Stream Maintenance Project Final Initial Study and Mitigated Negative Declaration*	2001	4/9/2014	Nontidal Wetland	2.19		1.98		N/A					The sediment removal projects impact a total of 2.13 acres of tidal wetland and 2.19 acres of non-tidal wetland, all in the San Francisco Bay watershed. Three of the proposed projects are in areas in which the District conducted sediment removal activities in 1997 or 1998. These "repeat" projects account for 0.27 acres of tidal wetland and 0.16 acres of non-tidal wetland. The District has already provided wetland mitigation for the impacts of those projects and will therefore not provide any mitigation for the repeat projects. Thus, the compensatory mitigation for the sediment removal projects for the 2001 SMP is proposed to be 1.86 acres of tidal wetland and 1.98 acres of nontidal wetland. 0.14 acres of nontidal wetland will mitigated at the proposed Los Capitancillos mitigation site and the remaining 1.84 acres at the proposed Coyote Parkway Mitigation Site. If the Los Capitancillos site cannot provide the allotted amount, the mitigation at the Coyote Parkway Mitigation Site will be increased.	Sediment Removal Sites: 1. Adobe Creek at Highway 101 2. Berryessa Creek, Milpitas Blvd. to Calaveras Blvd. 3. Berryessa Creek, Cropley Ave. to Sierra Creek Confluence 4. Berryessa Creek downstream and upstream of Piedmont Road 5. Calabazas Creek downstream of Highway 101 6. Calera Creek, UPRR to Milpitas Blvd. 7. Calera Creek upstream of Escue la Parkway 8. Canoas Creek Guadalupe Confluence to Cottle Road 9. Coyote Creek upstream Lower Penitencia confluence (sediment removal is ancillary to the bank protection) 10. Flint Debris Basin, upstream of Mount Pleasant Road 11. Guadalupe River, upstream Tasman to Montague 12. Los Caches Creek, downstream of Interstate 680 to Dempsey Rd. 13. Matadero Creek, Highway 101 to Louis Road 14. Randol Creek upstream and downstream of Bret Harte Drive 15. Ross Creek upstream and downstream of Cherry Ave. 16. Rucker Creek downstream Guibal Ave. (sediment removal is ancillary to the bank protection) 17. Sierra Creek downstream of Mauna Kea Lane Bank Protection Sites: 1. Calabazas Creek at Quarry Road 2. Canoas Creek upstream of Bluejay Drive 3. Canoas Creek upstream of Hillsdale A venue 4. Coyote Creek upstream Lower Penitencia Confluence 5. East Little Llagas Creek, San Martin Avenue to Church Avenue 6. Guadalupe Slough at Baylands 7. Los Gatos Creek upstream of Lincoln Avenue 8. Lower Penitencia Creek downstream of Redwood A venue 9. Matadero Creek at Josina Avenue 10. Rucker Creek downstream of Guibal A venue 11. San Tomas Creek upstream of McCoy A venue 12. Stevens Creek at Clearcreek Court (Site A)
	2001 Stream Maintenance Project Final Initial Study and Mitigated Negative Declaration	2001	4/9/2014	Tidal Wetland	2.13		1.86		N/A					The sediment removal projects impact a total of 2.13 acres of tidal wetland and 2.19 acres of non-tidal wetland, all in the San Francisco Bay watershed. Three of the proposed projects are in areas in which the District conducted sediment removal activities in 1997 or 1998. These "repeat" projects account for 0.27 acres of tidal wetland and 0.16 acres of non-tidal wetland. The District has already provided wetland mitigation for the impacts of those projects and will therefore not provide any mitigation for the repeat projects. Thus, the compensatory mitigation for the sediment removal projects for the 2001 SMP is proposed to be 1.86 acres of tidal wetland and 1.98 acres of nontidal wetland. The 1.86 acres of new tidal wetland impacts will be mitigated at the Cargill Pond A-4 mitigation site.	7. Los Gatos Creek upstream of Lincoln Avenue 8. Lower Penitencia Creek downstream of Redwood A venue 9. Matadero Creek at Josina Avenue 10. Rucker Creek downstream of Guibal A venue 11. San Tomas Creek upstream of McCoy A venue 12. Stevens Creek at Clearcreek Court (Site A) 13. Stevens Creek at Clearcreek Court (Site B) 14. Stevens Creek at Highway 85 15. Thompson Creek downstream of Pettigrew Court
SMP: Urgent Sediment Removal Project	*Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration*	1996	5/7/2014	Nontidal Wetland	0.1	1:1	0.1		N/A					San Francisquito Creek: Make an in-kind, off-site contribution to the Program Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. The project would debit the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	1.83	1:1	1.83		N/A					Lower Penitencia Creek: Make an in-kind, off-site contribution to the Program Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. The project would debit the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	5.2	1:1	5.2		N/A					San Tomas Aquino Creek: Make an in-kind, off-site contribution to the Program Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. The project would debit the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	0.22	1:1	0.22		N/A					Saratoga Creek: Make an in-kind, off-site contribution to the Program Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. The project would debit the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	0.17	1:1	0.17		N/A					Los Coches Creek: Include compensatory mitigation for the loss of 0.17 acres of low-value wetland habitat through the Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. A debit would be taken for the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	0.19	1:1	0.09		N/A					Calera Creek: Include compensatory mitigation for the loss of 0.19 acres of low-value wetland habitat through the Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. A debit would be taken for the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	1.96	1:1	1.96		N/A					Sunnyvale East Channel: Include compensatory mitigation for the loss of 1.96 acres of moderate to high-value wetland habitat, including sensitive species habitat through the Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. A debit would be taken for the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers. NOTE: This is an alternative to Measure Sunnyvale-01, 02, and 03.	
	Santa Clara Valley Water District Urgent Sediment Removal Project Final Initial Study and Mitigated Negative Declaration	1996	5/7/2014	Nontidal Wetland	1.85	1:1	1.85		N/A					Berryessa Creek: Include compensatory mitigation for the loss of 1.85 acres of moderate to high-value wetland habitat, including sensitive species habitat through the Mitigation Bank currently being designed under the Program EIR on Maintenance Activities. A debit would be taken for the amount of wetland removed in this reach at a ratio determined appropriate by the US Army Corps of Engineers.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Transmittal of Order No. 00-063 for Waste Discharge Requirements for the 2000 Sediment Removal Project	2000	5/2/2014	Nontidal Wetland	1.89	1:1	1.89		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the following: c. 1.89 acre of non-tidal wetlands at the Los Capitancillos site as compensation for impacts to 1.89 acres of non-tidal wetlands resulting from the Project.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Transmittal of Order No. 00-063 for Waste Discharge Requirements for the 2000 Sediment Removal Project	2000	5/5/2014	Nontidal Wetland	1	3:5	0.6		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the following: a. 0.6 acre of non-tidal wetlands at the Los Capitancillos site as compensation for impacts to 1.0 acre of non-tidal wetlands resulting from the Discharger's 1997 sediment removal project.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Waste Discharge Requirements for the Santa Clara Valley Water District 2001 Sediment Removal Project	2002	5/2/2014	Nontidal Wetland	1.98	1:1	1.98		N/A	10				Pending appropriate regulatory review and approval, the Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring. Plan, dated June 8, 1998, as revised, and the Santa Clara Valley Water District Coyote Creek Parkway Wetland Mitigation Site Mitigation Monitoring Plan dated May 2001. The plans shall be revised as needed to include the following: a. An additional 0.14 acre of non-tidal wetlands at the Los Capitancillos Wetland Mitigation site, and 1.84 acres of non-tidal wetlands at the Coyote Creek Parkway Wetland Mitigation site as compensation for new impacts to 1.98 acres of non-tidal wetlands resulting from the Project. The mitigation amounts between the Los Capitancillos and the Coyote Creek Parkway sites may be adjusted depending on the actual acres created at the Los Capitancillos site. b. The mitigation commitment for the Project will be included in the calculations performed in the Discharger's Multi-Year Stream Maintenance Program EIR for the purposes of determining what amount of mitigation for any cumulative loss of wetlands is necessary over the long-term.	Impacts are temporary Specific Site Impact Areas: Adobe Creek at Highway 101, 0.01ac tidal Berryessa Creek at Milpitas Blvd to Calaveras, 0.27ac tidal Berryessa Creek upstream and downstream of Piedmont, 0.03ac nontidal Calabazas Creek downstream of Highway 101, 0.27ac tidal and 1.44ac nontidal Calera Creek upstream UPRR to Milpitas, 0.17ac nontidal Calera Creek upstream Escuela Parkway, 0.05ac nontidal Canoas Creek Guadalupe confluence to Cottle Road, 0.15ac nontidal Guadalupe Creek upstream Tasman to Montague, 1.58ac tidal Los Coches Creek downstream 1-680 to Dempsey, 0.01ac nontidal Matadero Creek Highway 101 to Louis, 0.13ac nontidal Sierra Creek downstream Mauna Kea, 0.16ac nontidal

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Appendix E: Database of Compensatory Mitigation Obligations and Compliance

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Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
SMP: Urgent Sediment Removal Project	*Draft Stream Maintenance Program (created before Draft EIR)*	no date	N/A (Online)	Nontidal Wetland			0.6	0.6	0						Mitigation will occur at Los Capitancillos. Sediment Removal Sites: San Francisquito Creek at D/S Highway 101 Lower Penitencia Creek at V/S Dixon Landing Road San Tomas Aquino Creek at Agnew Road to Route 237 Saratoga Creek at V/S San Tomas Creek San Tomas Aquino Creek at V/S Highway 101 Los Coches Creek at V/S Highway 680 Calera Creek at D/S Escuela Parkway Stevens Creek at D/S L'Avenida Berryessa Creek at Highway 237
	California Regional Water Quality Control Board, San Francisco Bay Region, Waste Discharge Requirements for Santa Clara Valley Water District, Urgent Sediment Removal Project	1997	5/2/2014	Tidal Wetland	9.7				N/A	10				The conceptual mitigation plan proposes to create/restore tidal wetlands within a 40-acre parcel that is currently a Cargill salt pond near Alviso. A portion of this parcel to be determined based on wetland mitigation pidance contained in the Basin Plan, is to compensate for impacts resulting from this urgent sediment removal project. Due to urgency of the sediment removal activities, the final determination of required mitigation is deferred until the Regional Board acts on the 10-Year Program.	Specific Site Impact Areas: San Francisquito, 0.1 Lower Penitencia, 1.83 San Tomas Aquino, 5.2 Saratoga, 0.22 San Tomas Aquino, 0.06 Los Coches, 0.18 Calera, 0.09 Stevens, 0.25 Berryessa, 1.77
	California Regional Water Quality Control Board, San Francisco Bay Region, Water Discharge Requirements for the Santa Clara Valley Water District's 1998 Sediment Removal Project	1998	5/2/2014	Tidal Wetland	1.79	1:1	1.8		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation And Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the 1.8 acres of tidal wetlands restoration to compensate for the 1998 project impacts to 1.79 acres of tidal wetlands at the Berryessa Creek site (Lower Penitencia to Calaveras Boulevard).	Specific Site Impact Areas: Permanente downstream of Highway 101, 0.05 Sunnyvale East downstream of Highway 237 to Station 23+00, 0.35 Berryessa confluence with Lower Penitencia to Calaveras Blvd, 1.79 Berryessa confluence with Sierra Creek to Cropley Ave, 0.01 Berryessa Montague Expressway to Interstate 680, 0.05 Regnart confluence with Calabazas to Kim St, 0.07 Sierra Mauna Kea to Crater Lane, 0.04
	California Regional Water Quality Control Board, San Francisco Bay Region, Transmittal of Order No. 00-063 for Waste Discharge Requirements for the 2000 Sediment Removal Project	2000	5/2/2014	Tidal Wetland	0.78	1:1	0.78		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the following: c. 0.78 acre of tidal wetlands at the Cargill Pond A-4 Wetlands Mitigation Site as compensation for impacts to 0.78 acre of tidal wetlands.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Transmittal of Order No. 00-063 for Waste Discharge Requirements for the 2000 Sediment Removal Project	2000	5/3/2014	Tidal Wetland	8.9		10		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the following: a. 10 acres of tidal wetlands at the Cargill Pond A-4 Wetlands Mitigation Site as compensation for impacts to 8.9 acres of tidal wetlands.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Transmittal of Order No. 00-063 for Waste Discharge Requirements for the 2000 Sediment Removal Project	2000	5/4/2014	Tidal Wetland	1.8	1:1	1.8		N/A	10				The Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998. The plan shall be revised to include the following: b. 1.8 acres of tidal wetlands at the Cargill Pond A-4 Wetlands Mitigation as compensation for impacts to 1.8 acres of tidal wetlands from the Discharger's 1998 sediment removal project.	
	California Regional Water Quality Control Board, San Francisco Bay Region, Waste Discharge Requirements for the Santa Clara Valley Water District 2001 Sediment Removal Project	2001	5/2/2014	Tidal Wetland	1.86	1:1	1.86		N/A	10				Pending appropriate regulatory review and approval, the Discharger shall implement the Santa Clara Valley Water District Urgent Sediment Removal Project Compensatory Wetlands Mitigation and Monitoring Plan, dated June 8, 1998, as revised, and the Santa Clara Valley Water District Coyote Creek Parkway Wetland Mitigation Site Mitigation Monitoring Plan dated May 2001. The plans shall be revised as needed to include the following: a. An additional 1.86 acres of tidal wetlands at the Cargill Pond A-4 Wetland Mitigation Site as compensation for new impacts to 1.86 acres of tidal wetlands. b. The mitigation commitment for the Project will be included in the calculations performed in the Discharger's Multi-Year Stream Maintenance Program EIR for the purposes of determining what amount of mitigation for any cumulative loss of wetlands is necessary over the long-term.	Impacts are temporary Specific Site Impact Areas: Adobe Creek at Highway 101, 0.01ac tidal Berryessa Creek at Milpitas Blvd to Calaveras, 0.27ac tidal Berryessa Creek upstream and downstream of Piedmont, 0.03ac nontidal Calabazas Creek downstream of Highway 101, 0.27ac tidal and 1.44ac nontidal Calera Creek upstream UPRR to Milpitas, 0.17ac nontidal Calera Creek upstream Escuela Parkway, 0.05ac nontidal Canoas Creek Guadalupe confluence to Cottle Road, 0.15ac nontidal Guadalupe Creek upstream Tasman to Montague, 1.58ac tidal Los Coches Creek downstream 1-680 to Dempsey, 0.01ac nontidal Matadero Creek Highway 101 to Louis, 0.13ac nontidal Sierra Creek downstream Mauna Kea, 0.16ac nontidal
	Draft Stream Maintenance Program (created before Draft EIR)	no date	N/A (Online)	Tidal Wetland			10	10	0						Mitigation will occur at Pond A-4. Sediment Removal Sites: San Francisquito Creek at D/S Highway 101 Lower Penitencia Creek at V/S Dixon Landing Road San Tomas Aquino Creek at Agnew Road to Route 237 Saratoga Creek at V/S San Tomas Creek San
	California Regional Water Quality Control Board, San Francisco Bay Region, Modification of the Urgent Sediment Removal Project under Order No. 97-094	1997	5/2/2014	Wetland	0.02	1:1			N/A					Your proposal is consistent with and regulated under Order No. 97-094. All provisions of the Order No. 97-094 apply. However, mitigation for removal of the 0.2 acre of wetland shall be included in the calculation of whatever mitigation is developed in association with the District's planned 10-Year Maintenance Permit.	
	Project-Specific Addendum Number 1 to Memorandum of Understanding Number 331-89, Santa Clara Valley Water District and California Department of Fish and Game Memorandum of Understanding Routine Maintenance Activities in Improved Channels, 1997 Urgent Sediment Removal Project	1997	5/2/2014	Wetland			10		N/A					District shall mitigate the impacts of wetland removal by providing in-kind, off-site wetlands creation. Wetlands replacement compensation ratios shall be negotiated as part of the permitting process for the District's 10-Year Maintenance Program Regulatory Project. Regardless of the status of the 10-Year Project, initial creation of approximately 10 acres of tidal wetland shall commence no later than calendar year 1999.	
Adobe Creek Watershed: Foothill Expressway	*Adobe Creek Watershed Mitigation and Monitoring Plan (Revised)*	2001	4/21/2014	Riparian			0.66		N/A						
	Adobe Creek Flood Control Project Foothill Expressway Site, Year-8 (2013) Riparian Mitigation Monitoring	2013	4/21/2014	Riparian			0.66	0.66	0		Trees: 35% (Year 8) Shrubs: 15% (Year 8)	Trees: 15.3 % (Year 8) Shrubs: 8.8% (Year 8)	Yes	The results show that the site has not met the Year-8 performance criteria but will hopefully meet it in the subsequent years.	

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Adobe Creek Watershed: Upper Reach 5	*404 permit*		5/2/2014	Creek	1100 linear feet				N/A					site mitigation will be accomplished by replanting the construction area with native plants in accordance with the plans titled "Adobe Creek Upper Reach 5 Restoration Project, Planting Layout. Sheets 1 -23" dated October 31 2007	
	1600 permit	11/21/2007	5/2/2014	Native Oak Trees (exceeding 3 in. dbh)		5:1			N/A					Coast Live Oak. Monitored for a min. of 10 years	
	1600 permit	11/21/2007	5/2/2014	Native Trees (excluding Oaks) (exceeding 3 in. dbh)		3:1			N/A					Blue elderberry, California Bay, California buckeye. 11 trees including oak. Monitored for a min. of 10 years	
	1600 permit	11/21/2007	5/2/2014	Non-native trees (exceeding 3 in. dbh)	23 Trees	1:1			N/A						
	Adobe Creek Upper Reach 5 Riparian Mitigation Monitoring Plan	2007	4/21/2014	Non-Tidal Marsh	0.05		0.05		N/A	2				Taken into account in riparian mitigation	
	Adobe Creek Upper Reach 5 (Year -5) Riparian Mitigation Monitoring	11/06/2013	4/21/2014	Non-Tidal Marsh			0.05	0.05	0			289 native species. 2037 sq. ft. of non-native species (Year 5)	Yes	The freshwater marsh vegetation post-project acreage in Year-5 was 2,326 square feet and has met the pre-project acreage (0.05 acres) goal to assure that there is no net loss of this habitat.	
	401 SF Bay permit	11/08/2007	5/2/2014	Non-Tidal Marsh	0.05				N/A					0.02 permanent, 0.03 temporary	
	Adobe Creek Upper Reach 5 Riparian Mitigation Monitoring Plan	2007	4/21/2014	Riparian	0.58	1.3:1	0.76		N/A	Year 10	Trees: 15% Shrubs: 7% Ground Cover: 15% (Year 5). 50% Shrubs: 20% Ground Cover: 50% (Year 10)				
	Adobe Creek Upper Reach 5 (Year -5) Riparian Mitigation Monitoring	11/06/2013	4/21/2014	Riparian			0.76	0.76	0		Trees: 15% Shrubs: 7% Ground Cover: 15% (Year 5)	Trees: 37% Shrubs: 26% Ground Cover: 38% (Year 5)	Yes		
	401 SF Bay permit	11/08/2007	4/21/2014	Riparian	0.58	1.3:1	0.76		N/A					Impact - Native riparian species. 0.01 permanent (riparian canopy), 0.1 temporary (riparian canopy), 0.05 permanent (non-native riparian canopy), 0.42 temporary (non-native riparian canopy)	
	1600 permit	11/21/2007	4/21/2014	Riparian			0.76		N/A					Additional 0.20 acres of redwood grove for visual and aesthetics. Species at risk: CRLF, Western Pond Turtle, Cooper's hawk, Sharp-shinned hawk, long eared owl, white tailed kite, Nuttall's woodpecker, Lawrence's goldfinch, oak titmouse, pallid bat, Yuma Myotis	
	SCVWD GIS data	2/15/2009	6/3/2014	Riparian			0.76	0.76	0						
	Adobe Creek Upper Reach 5 Riparian Mitigation Monitoring Plan	2007	4/21/2014	Waters of the State	0.67		0		N/A					Taken into account in riparian mitigation	
	401 SF Bay permit	11/08/2007	5/2/2014	Waters of the State	0.67				N/A					0.23 permanent, 0.44 temporary	
	Adobe Creek Upper Reach 5 Riparian Mitigation Monitoring Plan	2007	4/21/2014	Waters of the U.S.	0.28		0		N/A					Taken into account in riparian mitigation	
	401 SF Bay permit	11/08/2007	5/2/2014	Waters of the U.S.	0.28				N/A					0.11 permanent, 0.17 temporary	
	Adobe Creek Upper Reach 5 Restoration Project Woodrat Mitigation Year Five (2013) Monitoring Report	2013	4/21/2014	Woodrat				20 structures (log bases) for construction of nests by woodrats	#VALUE!					Observations: 18 woodrat nests have shown signs of activity since the initial year of monitoring 2009.	
Calabazas Creek Flood Project	*Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan*	2010	4/21/2014	City of Saratoga Protected Trees (native)	13	2:1 and 3:1	35		N/A					Native trees: 9 impacted, 3:1, 27 trees required Nonnative trees: 4 impacted, 2:1, 8 Trees required	
	401 SF Bay permit	06/30/2010	5/2/2014	Jurisdictional waters (permanent)	0.03	3:1	0.09		N/A						
	401 SF Bay permit	06/30/2010	5/2/2014	Jurisdictional waters (temporary)	0.08	1:1	0.08		N/A						
	Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan	2010	4/21/2014	Jurisdictional wetlands (permanent)	0.03	3:1	0.09		N/A	5	70% (Year 5)			Total impact = 0.28 acres. Total MIT = 0.38 acres	
	Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan	2010	4/21/2014	Jurisdictional wetlands (temporary)	0.08	1:1	0.08		N/A						
	Calabazas Creek Flood Project: Saratoga, Santa Clara County, California Year-2 (2013) Riparian Mitigation Monitoring	09/26/2013	6/4/2014	Mixed Riparian			0.38	1.07	0		70% (Year 2) - survival	78% (Year 2) - survival	Y		
	FWS (Section 7)	06/24/2010	5/2/2014	Red Legged Frog (Upland and aquatic habitat)	1.3				N/A					to compensate for effects to red-legged frogs through payment of a fee in the amount of $86,300. Incidental take.	
	1600 permit	05/26/2010	5/2/2014	Riparian (permanent		3:1			N/A						
	Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan	2010	4/21/2014	Riparian (permanent)	0	3:1	0.06		N/A						
	401 SF Bay permit	06/30/2010	5/2/2014	Riparian (permanent)	0.02	3:1	0.06		N/A						
	Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan	2010	4/21/2014	Riparian (temporary)	0	1:1	0.15		N/A					Permanent impacts to riparian habitat understory will be mitigated at a ratio of 3:1, while temporary impacts will be mitigated at a ratio of 1:1. (Total impacted area: 0.28 ac; Total mitigation area: 0.38 ac)	
	1600 permit	05/26/2010	5/2/2014	Riparian (temporary)		1:1			N/A						
	401 SF Bay permit	06/30/2010	5/2/2014	Riparian (temporary)	0.15	1:1	0.15		N/A						
	FWS (Section 7)	06/24/2010	5/2/2014	Streambed, mixed riparian woodland, non-native annual grassland (permanent)	0.5				N/A						
	FWS (Section 7)	06/24/2010	5/2/2014	Streambed, mixed riparian woodland, non-native annual grassland (temporary)	0.8				N/A						
	1600 permit	05/26/2010	5/2/2014	Tree (Native)	20	3:1	60		N/A					Total of 27 trees will be removed. 16 coast live oaks, 3 valley oaks, 1 sycamore.	
	1600 permit	05/26/2010	5/2/2014	Tree (Non - Native)	7	2:1	14		N/A						
	Calabazas Creek Flood Project: Saratoga, Santa Clara County, California Year-2 (2013) Riparian Mitigation Monitoring	09/26/2013	6/4/2014	Trees											
	Calabazas Creek Flood Project: Saratoga Mitigation and Monitoring Plan	2010	4/21/2014	Wetland					N/A					Permanent project impacts (0.01 ac) to these jurisdictional features will be mitigated at a ratio of 3:1 while temporary impacts (520 sq. ft.) will be mitigated at a ratio of 1:1.	
	FWS (section 10)	01/26/1999	5/2/2014						N/A						
	404 permit	07/01/2010	5/2/2014						N/A					On-site mitigation must be implemented as described in the "Calabazas Creek Flood Project: Saratoga, Mitigation and Monitoring Plan" dated May 2010	
Guadalupe Creek Restoration Project	*Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California*	6/1/2013	4/21/2014	Riparian			6	8.5	0						
	401 SF Bay permit		5/2/2014	Riparian	1.1		6		N/A					The Restoration Project is an environmental enhancement of existing habitat along Guadalupe Creek. It is intended to mitigate un-mitigated impacts of the Downtown Project and self-mitigate any adverse impacts from construction of the Restoration Project. It is expected to result in a net environmental benefit.	
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	SRA				4.5	0	40	58% (Year 40) Shade	66% (2009-2010_	Y	15 ft. x 13,030 ft.	
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	SRA			13,000 linear feet	13,030 linear feet	#VALUE!						

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Guadalupe Creek Restoration Project	*401 SF Bay permit*		5/2/2014	SRA	861 linear feet		13,000 linear feet		N/A						
	1600 permit		5/2/2014	SRA					N/A						
	SCVWD GIS data		6/3/2014	SRA				11	0						
	401 SF Bay permit		5/2/2014	Waters of the State	0.6				N/A						
Guadalupe River Project (Downtown Project)	*1600 permit*	5/1/2002	5/2/2014	Riparian			21		N/A					Segment 1 and 2 (Between I-880 and Coleman)	
	Final Implementation Plan for Guadalupe River Project Mitigation and Monitoring Plan	3/1/2004	5/9/2014	Riparian			21		N/A						
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	Riparian			21	21	0		Native: 85% (Year 40) Non-native:: <15%	Native: 79% (Year 10) Non-native: <5%	Yes		
	401 SF Bay permit		5/2/2014	Riparian	13.77		21		N/A					on-site and off-site	
	1600 permit	5/1/2002	5/2/2014	Spawning gravels			25,190 square feet		N/A					Segment 1 and 2 (Between I-880 and Coleman)	
	Final Implementation Plan for Guadalupe River Project Mitigation and Monitoring Plan	3/1/2004	5/9/2014	Spawning gravels			25,190 square feet		N/A						
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	Spawning gravels			27,312 square feet.	5,668 square feet.	#VALUE!		80% of WY 2001 and WY 2003 gravel coverage maintained 75% of the abundance at the same elevation in WY 2001 and WY 2003. 5,340 square feet in Reach A and 1,972 feet in Guadalupe Creek	498 sq. feet below objective in Reach A and 1150 sq. ft. below objective in Guadalupe creek.	No	Addition of spawning gravel is planned	
	401 SF Bay permit		5/2/2014	Spawning gravels	19,760 square feet		25,190 square feet		N/A						
	1600 permit	5/1/2002	5/2/2014	SRA			22,836 linear feet		N/A					Segment 1 and 2 (Between I-880 and Coleman). 575 -Contract 1. 1081 - Contract 2. 878 - Contract 3A. 410 - Woz Way to Park Ave. Bypass Reach. Offsite - 7848 Reach A between Airport Parkway and I-880. 12044 - Guadalupe Creek between Mason Dam and Almaden Expressway	
	Final Implementation Plan for Guadalupe River Project Mitigation and Monitoring Plan	3/1/2004	5/9/2014	SRA			23,677 linear feet		N/A					20,826 off site. 2851 on site.	
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	SRA				23,755 linear feet	#VALUE!		17 trees and 10 shrubs per 100 lf must survive each year for 3 years after planting in the mitigation area	15 trees and 7 shrubs per 100 survived each year for 3 years after planting in the mitigation area	No	Although the survival of planted willows did not meet the measurable objective, it was met when naturally recruited native trees and shrubs were included	
	401 SF Bay permit		5/2/2014	SRA	8,315 linear feet		18,026 linear feet		N/A					on-site and off-site	
	SCVWD GIS data	11/1/1994	6/3/2014					21.81							
Jacques Gulch Restoration Project	*404 permit*		5/2/2014	California Tiger Salamander Habitat	4				N/A					Temporary Impact	
	401 SF Bay permit	3/10/2009	5/2/2014	Jurisdictional waters	3.63				N/A					Permanent impact - 0.55 acres. Temporary Impact - 3.08 acres. Self mitigating	
	404 permit		5/2/2014	Jurisdictional Waters	0.438	1:1	0.438		N/A						
	401 SF Bay permit	3/10/2009	5/2/2014	Riparian	0.25	2:1	0.5		N/A					0.07 impact from tree canopy area	
	SCVWD GIS data	9/3/2009						1.9							
Lenihan Dam Outlet Modification Project	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Mixed Plantings			0.09	0.23	0					6400 square feet. 3700 sq. ft. of native woody and herbaceous upland vegetation	
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland.	200 linear feet		0.092		N/A			86% survival (Year 4)			
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Arroyo Willow.	3 Trees	3:1	9 Trees	40	#VALUE!			100% survival (Year 4)			
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Bigleaf maple	1 Tree	3:1	3 Trees	3	#VALUE!			N/A			
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. California Bay	1 Tree	3:1	3 Trees	3	#VALUE!			100% survival (Year 4)			
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Canyon Oak	1 Tree	10:1	10 Trees	10	#VALUE!			92% survival (Year 4)			
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Elderberry	1 Tree	3:1	3 Trees	3	#VALUE!						
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Elderberry. Reservoir Bank	3 Trees	3:1	9 Trees	10	#VALUE!						
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Woodland. Eucalyptus. Reservoir Bank	4 Tree	1:1	4 Trees	7	#VALUE!					4000 square feet	
	Lenihan Dam Outlet Modification Project Annual Monitoring Report Year 4 (2013)	2013	6/3/2014	Freemont's cottonwood	4 Trees	1:1	4 Trees	4							
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Arroyo Willow.	3 Trees	3:1	9 Trees	40	#VALUE!	5	70% survival (Year 5)				
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Bigleaf maple	1 Tree	3:1	3 Trees	3	#VALUE!	5	70% survival (Year 5)				
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. California Bay	1 Tree	3:1	3 Trees	3	#VALUE!	5	70% survival (Year 5)			Year 1: 90% survival in good or fair condition (all species) Year 2: 90% survival in good or fair condition (all species) Year 3: 80% survival in good or fair condition (all species) Year 4: 80% survival in good or fair condition (all species) Year 5: 70% survival in good or fair condition (oak), 90% foliar cover (all other species) & 90% foliar cover	
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Canyon Oak	1 Tree	10:1	10 Trees	10	#VALUE!	10	90% (Year 10)			Monitoring may cease if 90% foliar cover metric is met before Year 10. Year 6: 90% survival in good or fair condition (oak), no monitoring required (all other species) Year 7: 60% survival in good or fair condition (oak) Year 8: 60% survival in good or fair condition (oak) Year 9: 60% survival in good or fair condition (oak) Year 10: 90% foliar cover (oak)	
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Elderberry	1 Tree	3:1	3 Trees	3	#VALUE!	5	70% survival (Year 5)				
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Elderberry	3 Trees	3:1	9 Trees	10	#VALUE!	5	70% survival (Year 5)				
Lenihan Dam Outlet Modification Project	*Lenihan Dam Outlet Modification Project Revegetation Plan*	2007	4/21/2014	Woodland. Eucalyptus	4 Trees	1:1	4 Trees	7	#VALUE!	5	70% survival (Year 5)				
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Freemont's cottonwood	4 Trees	1:1	4 Trees	4	#VALUE!						
	Lenihan Dam Outlet Modification Project Revegetation Plan	2007	4/21/2014	Woodland. Shrubs		1:1			N/A	5	70% survival (Year 5)				
	SCVWD GIS data		6/3/2014					0.46	0						

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Appendix E: Database of Compensatory Mitigation Obligations and Compliance

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Lower Coyote Creek Flood Control Project: Reach 1	*SFBCDC Permit*	5/30/1985	5/29/2014	Brackish Water Pond			16.5		N/A						
	Department of the Army Section 10	5/30/1985	5/29/2014	Islands			3 islands		N/A					3 islands will be created in bomb disposal area. The district will excavate three seasonal pond sites and several low flow channels to allow effective water management in the area.	
	Lower Coyote Creek Flood Control Project. Reaches 1, 2, & 3: Dixon Landing Road to Montague Expressway Cities of San Jose and Milpitas 2009 Monitoring Report	2009	4/21/2014	Pickleweed habitat (salt marsh harvest mouse and water birds.)				87		100		29.5 acres		29.5 acres acquired in 2009. Trappings of SMHM was 1.75	
	SCVWD GIS data	10/1/1989	6/3/2014	Pickleweed habitat (salt marsh harvest mouse and water birds.)				70							
	Lower Coyote Creek Flood Control Project. Reaches 1, 2, & 3: Dixon Landing Road to Montague Expressway Cities of San Jose and Milpitas 2009 Monitoring Report	2009	4/21/2014	Pond				16.5							
	Santa Clara Valley Water District Lower Coyote Creek Flood Control Project Monitoring and Management Program	11/1/1992	5/29/2014	Salt Marsh			56		N/A	5	1 harvest mouse/ 200 trappings. 85% cover or greater for restoration marsh, with at least 60% pickleweed cover. 85% cover at levee				
	Department of the Army Section 10	5/30/1985	5/29/2014	Salt Marsh	3.2		5.5		N/A					San Jose Sludge Pond No. 49 Replacement. The total area od resulting managed wetlands is 55 acres.	
	Wetland Habitat Management Plan For The Lower Coyote Creek Flood Control Bypass Channel	3/24/1987	5/29/2014	Salt Marsh			54		N/A						
	SFBCDC Permit	5/30/1985	5/29/2014	Salt Marsh (Seasonal Wetland)			54		N/A						
	SFBCDC Permit	5/30/1985	5/29/2014	Salt Pond	16.5		16.5		N/A						
	SFBCDC Permit	5/30/1985	5/29/2014	Upland			16.5		N/A						
	Wetland Habitat Management Plan For The Lower Coyote Creek Flood Control Bypass Channel	3/24/1987	5/29/2014	Water Habitat			18		N/A						
	Santa Clara Valley Water District Lower Coyote Creek Flood Control Project Monitoring and Management Program	11/1/1992	5/29/2014	Waterbird Pond			16.5		N/A		Use/non-use criteria. If birds are seen using the pond during most seasons. No more than 2 consecutive surveys with no birds.				
	Department of the Army Section 10	4/24/1987	5/29/2014						N/A					Shall follow "Wetland Habitat Management Plan:	
	SCVWD GIS data	10/1/1989	6/3/2014					23.55							
Lower Coyote Creek Flood Control Project: Reach 2	*Coyote Creek Reach 3 Mitigation and Monitoring Program*	7/1/1994	5/29/2014	Riparian		2.4:1	12.7	12.7	0	100				Between Reach 2 and Reach 3, Riparian mitigation is 28.7/ Impact is 12	
	404 permit	6/1/1994	5/2/2014	Vegetation					N/A					Between 1987 and 1993	
	Department of the Army Section 10	6/16/1989	5/29/2014						N/A					Revegetation plan shall be developed to mitigate for riparian losses	
	SCVWD GIS data	10/1/1993	6/3/2014					8							
Lower Coyote Creek Flood Control Project: Reach 3	*Coyote Creek Reach 3 Mitigation and Monitoring Program*	7/1/1994	5/29/2014	Jurisdictional Waters (Seasonal Wetland)	0.4		0.4			100	50% cover of wetland species. Must meet Hydrology criteria in Wetland Delineation Manual (Year 5)				
	401 SF Bay permit	1994	5/2/2014	Riparian	2.6		16.5		N/A					Vegetation installed In 1996. Streambank	
	Coyote Creek Reach 3 Mitigation and Monitoring Program	7/1/1994	5/29/2014	Riparian		2.4:1	16.5		N/A	100	45% cover (Year 5) 70% cover (Year 10)			Additional requirements in Corps permit 20178512 See. 6 1994. Plan is to mitigate 23.5 acres	
	404 permit	8/14/1994	5/29/2014	Riparian	2.6		16.5		N/A						
	401 SF Bay permit	1994	5/2/2014	Rocked Streamside Area Planting			0.5		N/A						
	Coyote Creek Reach 3 Mitigation and Monitoring Program	7/1/1994	5/29/2014	Rocked Streamside Area Planting			0.5		N/A	100	50% cover (Year 5)				
	404 permit	8/14/1994	5/29/2014	Rocked Streamside Area Planting			0.5		N/A						
	401 SF Bay permit	1994	5/2/2014	Setback Planting			2		N/A						
	Coyote Creek Reach 3 Mitigation and Monitoring Program	7/1/1994	5/29/2014	Setback Planting			2		N/A	100	N/A				
	404 permit	8/14/1994	5/29/2014	Setback Planting			2		N/A						
	401 SF Bay permit	1994	5/2/2014	SRA			1		N/A						
	Coyote Creek Reach 3 Mitigation and Monitoring Program	7/1/1994	5/29/2014	SRA			2,510 linear feet		N/A	100					
	404 permit	8/14/1994	5/29/2014	SRA			1		N/A						
	SCVWD GIS data	10/1/1997	6/3/2014	Total mitigation				22							
	401 SF Bay permit	1994	5/2/2014	Wetland	1.6		0.5		N/A						
	404 permit	8/14/1994	5/29/2014	Wetland	1.6		0.5		N/A						
	401 SF Bay permit	1994	5/2/2014	Wetland (Possibly, TBD)	2.1	1:1	Mitigation amount will depend on impact, which will be between 0 and 2.1 acres.		N/A					Mitigation amount will depend on impact, which will be between 0 and 2.1 acres.	
	404 permit	8/14/1994	5/29/2014	Wetland (Possibly, TBD)	2.1	1:1			N/A						
	404 permit	9/1/1999	5/2/2014						N/A					SCVWD shall implement provision in Coyote Creek Reach 3 Mitigation and Monitoring Program dated July 1, 1994	

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Project	Document	Year	Date Received	Habitat Type (optional)	Impact Area (acres)	Mitigation Ratio (Mitigation : Impact)	Mitigation Required (acres)	Mitigation Acquired (acres)	Mitigation Deficient (acres)	Required Monitoring Time Frame (Years)	Success Criteria (% at year)	Percentage Cover Acquired (%)	Meets Required Monitoring Criteria (Y/N)	Text Within Document	Other Information
Lower Guadalupe River Flood Protection Project (LGRP)	*401 SF Bay permit*	2002	5/2/2014	Riparian	2.16	3:1	6.48		N/A					Permanent	
	Draft Lower Guadalupe River Flood Protection Project Mitigation and Monitoring Plan	8/1/2002	5/12/2014	Riparian	2.16	3:1	6.48		N/A	100	50% survival (Year 5) 30% canopy cover (Year 10) 80% canopy cover (Year 40)			Mitigation at Reach A (1.88 acres), B (2.23 acres), C (2.36 acres). Mitigation required is 6.48 and what will be mitigated will be 6.9	
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	Riparian			6.48	6.14	0.34			80% (Year 8)	No	**Discrepancy in mitigation area.** Reach A (1.75 acres), B (1.54 acres), C (2.85 acres). "WY 2012 Results: Reach A met the performance standard for MY 5 (at least 50% cover) in WY 2009 with 76% cover of native trees and shrubs. In WY 2012 (MY 8), Reach A had 80% native woody cover, which exceeded the performance standards for MYs 5 (50%), 10 (30%), and met the year-40 performance standard of 80%."	
	1600 permit	04/20/2003	5/2/2014	Riparian	2.16	3:1	6.48		N/A					Minimum of 1.88 acres shall be implemented at Reach A. Minimum of 2.33 acres shall be implemented on Reach B. Total of 2.37 acres in Reach C with 18 planting areas	
	FWS (Section 7)	04/21/2003	5/2/2014	Riparian	4.13	3:1	12.39	6.14	6.25					Reaches A, B, and C. Levee Setback at Reach B	
	Biological Opinion	04/21/2003	5/2/2014	Ruderal Vegetation	73.72	0	0		N/A					All Reaches	
	Biological Opinion	04/21/2003	5/2/2014	SRA	104 linear feet				N/A					All Reaches. Streamside mitigation in these areas would increase the functions and values of the existing habitat for aquatic species by providing overhead and instream SRA cover.	
	401 SF Bay permit	2002	5/2/2014	Wetland	30.8		35.54		N/A	15	75 % cover (Year 15)			Permanent Impact: 3.47 and Temporary: 27.3	
	1600 permit	04/20/2003	5/2/2014	Wetland	2.04		3.5		N/A					2 acres shall be restored in the existing 3.5 acre upland habitat IF the recovery of the unauthorized 2.04 acres\ clearing from a previous permit does not recover. The other 1.5 comes from soil excavation.	
	1600 permit	04/20/2003	5/2/2014	Wetland (permanent impact)	0.43	2:1	0.86		N/A						
	1600 permit	04/20/2003	5/2/2014	Wetland (temporary impact)	3.34	1:1	3.34		N/A						
	Island Ponds Mitigation Monitoring Report Year 7	2012	4/21/2014	Wetland/Waters			35.54	32.25	3.29			54%	Yes	Mitigated with Island Ponds Restoration Project. On its way.	
	Draft Lower Guadalupe River Flood Protection Project Mitigation and Monitoring Plan	8/1/2002	5/12/2014	Wetland/Waters	27.03	1:1 and 2:1	31.34		N/A					Wetland monitoring will be developed with the Pond A4 restoration program. Nontidal wetland (Impact = 1.75 ac. Mit = 3.5 ac). Tidal Wetland (Impact =22.65 ac. Mit. = 22.72 ac.). Other Waters (Impact = 2.63 ac. Mit. = 5.12 ac.)	
	Water Year 2012. Mitigation Monitoring Report for the Guadalupe River Projects, Downtown and Lower San Jose and Santa Clara, California	6/1/2013	4/21/2014	Wetland/Waters			35.54		N/A					Will be mitigated with Island Ponds Restoration	
	FWS (Section 7)	04/21/2003	5/2/2014	Wetland/Waters	46.62	2:1	93.24	32.25	60.99					All Reaches	
	404 permit	04/28/2003	5/2/2014	Wetlands/Waters	14.23		12.15		N/A					Permanent impact = 3.37 acres. Temporary impact = 10.86 acres. Permanent impact mitigated at 2:1 for aquatic resources and 3:1 for riparian. Temporary impacts mitigated at 1:1. **T**emporary impacts on nontidal freshwater wetlands mitigated at 2:1. Impacts (Mitigation)/Temporary: Non Tidal Wetland = 0.23 (0.46)/ Tidal Freshwater Wetland = 0.39 (0.39)/ LGRP Other Waters/Open Water = 1.47 (1.47)/ Tidal Freshwater Wetland = 2.89 (2.89)/ Baylands Other Waters/ Open Water = 5.88 (0). **Permanent Impact** (Mitigation) (Permanent): Non Tidal Wetland = 0.42 (0.96)/ Tidal Freshwater Wetland = 2.05 (4.10)/ LGRP Other Waters/Open Water = 0.47 (1.02)/ Tidal Freshwater Wetland = 0.43 (2.89)	
Lower Silver Creek Flood Protection and Creek Restoration Project	*Lower Silver Creek Watershed Project MMRP*	12/1/2001	5/9/2014	Jurisdictional waters	8.8	1.4:1	12.7		N/A	10				4.7 wetland and 4.1 open water	
	Lower Silver Creek Flood Protection and Creek Restoration Project. Year 7 Mitigation and Monitoring Report: Reaches 1 & 3	2011 (Year 7)	4/21/2014	Jurisdictional waters			12.7	12.7	0					Habitats to be created in Reaches 1 - 6. Includes 4.7 acres of jurisdictional wetlands. (1.4:1 mitigation ratio)	
	401 SF Bay permit		5/2/2014	Jurisdictional waters	8.8	1.4:1	12.7		N/A					4.7 impact for in-stream freshwater wetlands and 4.1 is impact to open waters of the state	
	1600 permit	12/22/2006	5/2/2014	Jurisdictional Waters (Wetland temporary impact)	4.7				N/A					Revegetation will be implemented as described in Section 6 of the Lower Silver Creek Watershed Mitigation and Monitoring Program (December 2001). 8.8 acres of fill.	
	404 permit	5/7/2002	5/2/2014	Jurisdictional Waters of the U.S.	4.1	1.4:1	5.74		N/A						
	404 permit	5/7/2002	5/2/2014	Jurisdictional Waters (Wetland)	4.17	1.4:1	5.838		N/A						
	Lower Silver Creek Watershed Project MMRP	12/1/2001	5/9/2014	Riparian/SRA	0		5		N/A		70% Survival (Year 5). 30% cover (Year 5). 70% woody canopy cover (Year 10)			Enhancement feature per District Policy E-1	
Lower Silver Creek Flood Protection and Creek Restoration Project	*Lower Silver Creek Flood Protection and Creek Restoration Project. Year 7 Mitigation and Monitoring Report: Reaches 1 & 3*	2011 (Year 7)	4/21/2014	Riparian/SRA			5	5	0					Habitat enhancement only.	
	401 SF Bay permit		5/2/2014	Riparian/SRA			5		N/A						
	Lower Silver Creek Flood Protection and Creek Restoration Project. Year 7 Mitigation and Monitoring Report: Reaches 1 & 3	2011	4/21/2014	Upland			6	6	0					1:1 mitigation ratio. 4 additional acres for landscaping feature.	
	Lower Silver Creek Watershed Project MMRP	12/1/2001	5/9/2014	Upland	2	1:1	6		N/A	10	70% Survival (Year 5). 30% cover (Year 5). 70% avg woody canopy cover (Year 10). 50% minimum cover at all sites (Year 10)			Additional 4 acres for landscaping features.	
	401 SF Bay permit		5/2/2014	Upland	2				N/A					Non Jurisdictional	
	401 SF Bay permit		5/2/2014	Upland			6		N/A					4 acres along the bank	
	SCVWD GIS data	11/1/2004	6/3/2014					18.49							
	Lower Silver Creek Flood Protection and Creek Restoration Project. Year 7 Mitigation and Monitoring Report: Reaches 1 & 3	2011 (Year 7)	4/21/2014						N/A					Planting in most locations (Reach 1 -3) in 7th year indicate that the plantings in most locations are on track to achieve the year 10 success criterion of 50 percent cover of woody species.	
Matadero Barron Creek Long Term Remediation Project	*Matadero Barron Creek Long Term Remediation Project Mitigation and Monitoring Plan*	01/29/2003	4/21/2014	Freshwater Marsh	0.17	2.2:1	0.28	0.37	0	5	15% (Year 2) 30% (Year 3) 60% (Year 5)			Permanent impacts: .11 acres, temporary impact: .06 acres.	
	Matadero Barron Creek Long Term Remediation Project Mitigation and Monitoring Plan Year 7 (2011) Annual Monitoring Report (USACE File Number 26877S)	2011	4/21/2014	Riparian				0.37	0	10		51 % (Year 5) 61 % (Year 7)	Yes	Requires monitoring until Year 10. But on track.	
	Matadero Barron Creek Long Term Remediation Project Mitigation and Monitoring Plan	01/29/2003	4/21/2014	Riparian	1.14	2.2:1	2.46	2.46	0	10	5% (Year 3) 15% (Year 5) 30% (Year 7) 50% (Year 10)			Permanent impacts: .66 acres, temporary impact: .48 acres./ 1.82 on site mitigation, .64 off site mitigation at East Bayshore road mitigation site.	
	1600 permit	11/13/2003	5/2/2014	Riparian	1.14	3:1	2.46		N/A					Impact: .48 (temporary) and .66 (permanent). Mitigation: 1.82 (on-site) and 0.64 (off-site). 3:1 For each unit area that is stripped of vegetation.	
	Matadero Barron Creek Long Term Remediation Project Mitigation and Monitoring Plan Year 7 (2011) Annual Monitoring Report (USACE File Number 26877S)	2011	4/21/2014	Wetland			0.07	0.37	0			63% (Year 5)	Yes	In the Year-3 monitoring it was found that the delineated area of wetland mitigation fell short of the required area of 0.28 acre. Only 0.167 acre was created. Therefore, the SCVWD (with approval from the regulatory agencies) proposed to include a 0.203 acre wetland area adjacent to the southern edge of the created wetlands that had naturally recruited hydrophytic plant species since project construction. **0.09 acres of more mitigation than required.**	
	404 permit	02/04/2004	5/2/2014	Wetland	0.06		0.28	0.28	0					Impact - permanent = .01 and temporary = .05. Ratios - 1:1 for temporary and 2:1 for permanent. **.21 acre will be used for any future potential maintenance impacts.**"Riparian and Wetland Mitigation and Monitoring Plan"	
	SCVWD GIS data	2/15/2005	6/3/2014					2.46							

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Reconstruction of Bollinger Bridge over Calabazas Creek	*404 permit*	05/10/2005 (Phase 2)	5/2/2014	Jurisdictional waters	0.21	1:1	0.21		N/A						
	Reconstruction of Bollinger Road over Calabazas Creek . Year 5 Monitoring Report (Phase 2 New Bridge Site)	2013	4/21/2014	Native Trees			9 trees	33 Trees	0	5	70% (Year 5)	71%	Yes	Survival and vigor of revegetation plantings at the Bollinger Bridge Reconstruction Site are doing well after the fifth year. Maintenance activities for 2013 were successful. Since this site exceeds the required 70% survival rate at Year 5 and there is significant natural recruiting of native plants it is recommended that monitoring cease at this time	
	401 SF Bay permit	5/25/2005	5/2/2014	Native Trees	3 Trees	3:1	9 trees		N/A						
	IS/MND	4/1/2003	5/9/2014	Natural gravel stream channel	0.25				N/A						
	Reconstruction of Bollinger Road over Calabazas Creek . Year 5 Monitoring Report (Phase 2 New Bridge Site)	2013	4/21/2014	Plant Community						5	70% (Year 5)	71%	Yes	Survival and vigor of revegetation plantings at the Bollinger Bridge Reconstruction Site are doing well after the fifth year. Maintenance activities for 2013 were successful. Since this site exceeds the required 70% survival rate at Year 5 and there is significant natural recruiting of native plants it is recommended that monitoring cease at this time	
	IS/MND	4/1/2003	5/10/2014	Riparian	230 linear feet				N/A						
	Reconstruction of Bollinger Road over Calabazas Creek . SCVWD Project No. 201015. Mitigation and Monitoring Plan	12/1/2004	4/21/2014	Riparian			0.08		N/A					Arroyo willow, red willow, more than 109 plants. 3700 square feet	
	Reconstruction of Bollinger Road over Calabazas Creek . SCVWD Project No. 201015. Mitigation and Monitoring Plan	12/1/2004	4/21/2014	Riparian/Upland			0.03		N/A					1200 square feet. 31 plants	
	Reconstruction of Bollinger Road over Calabazas Creek . SCVWD Project No. 201015. Mitigation and Monitoring Plan	12/1/2004	4/21/2014	Upland			0.13		N/A					Trees: Coast Live Oak, Valley Oak, California Buckeye, Mexican Elder berry, California Bay. Shrubs: Toyon, California Wild Rose, California Blackberry, California Sage, Muckwort, Virgin's Bower, Bearded Wild Rye. More than 89 plants. 5800 square feet	
	404 permit	04/17/2008 (Phase 1)	5/2/2014	Wetland	0.05				N/A					Far wetland losses of .1 acre or less that require pre-construction notification, the district engineer may determine on case-by-case basis that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.	
	SCVWD GIS data	12/2/2005						0.15							
	SCVWD GIS data	1/27/2009						0.085							
Upper Guadalupe River Flood Control Project	*401 SF Bay permit*	12/16/2013	6/17/2014	Nontidal freshwater wetlands	1.47	1:1	1.47		N/A						
	401 SF Bay permit	12/16/2013	6/17/2014	Riparian	10.45	2:1	20.89		N/A						
	401 SF Bay permit	12/16/2013	6/17/2014	SRA	4,886 linear feet	1:1	4,886 linear feet		N/A						
	401 SF Bay permit	12/16/2013	6/17/2014	Undercut Bank	1,720 linear feet	1:1	1,720 linear feet		N/A						
	404 permit	12/16/2013	6/17/2014	Other Waters	10.13				N/A					Mitigation shall be carried out in accordance with the "Final Environmental Impact Report/ Environmental Impact Statement." November 1999	
	Water Year 2013. Mitigation Monitoring Report for the Lower, Downtown and Upper Guadalupe River Flood Protection Projects, San Jose and Santa Clara, California	3/1/2014	6/17/2014	Riparian				0.7							
	SCVWD GIS data	12/15/2012	6/17/2014	Riparian				3.3							
	Water Year 2013. Mitigation Monitoring Report for the Lower, Downtown and Upper Guadalupe River Flood Protection Projects, San Jose and Santa Clara, California	12/15/2012	6/17/2014	Undercut Bank				1,514 linear feet			1514 linear feet @ Year 1	1720 linear feet @ Year 20			
Almaden Reservoir/ Dam Maintenance	401 SF Bay permit	6/18/2013	9/24/2014	Riparian	0.05	3:1	0.15								
	CDFW 1600 permit	6/14/2013	9/24/2014	Riparian	0.05	3:1	0.15								
Andersan Dam/ Dam Maintenance	CDFW 1600 permit	6/14/2013	9/24/2014	Riparian	0.2	3:1	0.6								
Stevens Creek Reservoir/Dam Maintenance	401 SF Bay permit	6/18/2013	9/24/2014	Riparian	0.01	1:1	0.01								
Stevens Creek Reservoir/Dam Maintenance	CDFW 1600 permit	6/14/2013	9/24/2014	Riparian	0.01	1:1	0.01								
Uvas Dam and Chesbro Dam/ Dam Maintenance	401 SF Bay permit	6/18/2013	9/24/2014	Riparian	0.01	3:1	0.03								
Uvas Dam and Chesbro Dam/ Dam Maintenance	CDFW 1600 permit	6/14/2013	9/24/2014	Riparian	0.01	1:1	0.01								
Vasona Reservoi/ Dam Maintenance	401 SF Bay permit	6/18/2013	9/24/2014	Wetland	0.12	1:1	0.12								
Vasona Reservoi/ Dam Maintenance	CDFW 1600 permit	6/14/2013	9/24/2014	Wetland	0.12	1:1	0.12								

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Table E-2: Benchmarking Database of Compensatory Mitigation Obligations

Benchmarking Agency	Project Name	Habitat	RWQCB						ACOE						USFWS						CDFW					
			Permanent Impact	Temporary Impact	Ratio	Mitigation Required	Monitoring Time Frame (Years)	Success Criteria	Permanent Impact	Temporary Impact	Ratio	Mitigation Required	Monitoring Time Frame (Years)	Success Criteria	Permanent Impact	Temporary Impact	Ratio	Mitigation Required	Monitoring Time Frame (Years)	Success Criteria	Permanent Impact	Temporary Impact	Ratio	Mitigation Required	Monitoring Time Frame (Years)	Success Criteria
Contra Costa County	Norris Canyon Estate San Catanio Creek Tributary Stabilization Project	Waters	652 linear feet		0.84:1	550 linear feet	5																		5	80% survival at year 5. 75% cover at year 5
		Trees	85		3:1	255	5																3:1		5	75% cover at Year 5
	The Fernandez Ranch Public Access and Creek Restoration Project	Riparian Wetland		0.35	3.3:1	1.17	10																			
		Seasonal Wetland	0.092		2:1	0.184	10																			
Contra Costa Water Agency	Alternative Intake Project	Waters																			0.7		3:1	2.1		
	Los Vaqueros Reservoir Expansion Project	Trees																					3:1			
		Revegetation																					1:1		5	80% survival at year 5
		Wetlands																						20.01		
Marin Municipal Water District	Devils Gulch Water Quality Improvement Project	Waters		0.16	1:1	0.016	5																			
	Phoenix Lake Road Pipeline Seismic Reliability Project	Waters of the state	0.05				5	85% shrub cover @ Year 5, 95% herb cover @ Year 5, 80% tree survival @ Year 5																		
		Trees			3:1		5	5, 80% tree survival @ Year 5																		
EBMUD	San Pablo Dam Seismic Upgrade Project	Cattail dominated freshwater marsh	1.5			1.5	10		1.5			1.5 (seasonal wetland)	10		1.5			1.5 (seasonal wetland)	10		1.5			1.5 (seasonal wetland)	10	
		Central Coast Riparian	0.5			12.97	10		0.5			13,100 linear feet of stream channel	10		0.5			13,100 linear feet of stream channel	10		0.5			13,100 linear feet of stream channel	10	
		Stream/freshwater marsh		0.62			10			0.62		New pond	10			0.62		New pond	10			0.62		New pond	10	
		CRLF				37 acres @ Scow Canyon	10					37 acres @ Snow Canyon	10					37 acres @ Snow Canyon	10					37 acres @ Snow Canyon	10	
SFPUC	Calaveras Dam Replacement Project	Wetlands	2.5	0.59		4.1	5	70% cover @ Year 5	6.81 acres	20.90 acres (8.43 acres ifthe barge option is not implemented)					650		1.8:1	1151.49 acres (wetland/waters/upland)			0.55	0.1	1.1:1 and 3:1	1.76		
		Stream/Riparian/Open Water	14.07	19.7		107.9	10	Riparian: 75% survival @ Year 2, 60% cover @ Year 5. Sage Scrub: 5% cover @ Year 3. Upland and mesic grassland: 40% cover @ Year 1, 50% cover @ Year 3	6.81 acres	20.90 acres (8.43 acres ifthe barge option is not implemented)					650		1.8:1	1151.49 acres (wetland/waters/upland)			0.06	0.07	1.1:1 and 3:1	2.76		
		Riparian																			0.34	2.25	1.1:1 and 3:1	6.72		
		Freshwater Marsh																				1.04	3:1	3.12		
		Stream/Riparian/Open Water	4,603 linear feet	1,612 linear feet		60,160 linear feet	10	Oak Woodland: 50% survival @ Year 2, 30% Survival @ Year 10. 45% cover @ Year 10													4.593 lf	1.281 lf	1.1:1 and 3:1	15,518 lf		

Note: Colors correspond to benchmarking agencies and are used to make the document easier to view

Appendix E: Benchmarking Database of Compensatory Mitigation Obligations

Note: Hatched cells indicate that either the category does not apply or the data were not available

Table E-2: Benchmarking Database of Compensatory Mitigation Obligations

	Pipeline Seismic Upgrade	Waters of the state	0.02 acres/ 222 linear feet		1:1	0.02 acres/ 222 linear feet	3	40% cover @ Year 1, 50% cover @ Year 2, 70% survival @ Year 3													N/A	0.007 acres (project total)		N/A		
	San Antonio Backup Pipeline	Creek/Riparian		0.45	1:1	0.455				0.05 acres					0.82 acres (upland species habitat)	18.42 acres (upland species habitat)		14.5 acres			0.03 acres	0.45 acres		0.14 acres/21 lf		
		Creek/Riparian	0.03		4.3:1	0.13																				
Sonoma County Water Agency	Matanzas Creek Detention Reservoir Sediment Removal Project	Seasonal Wetland		0.55	1.56:1	0.86																				
		Riparian	1.7	1.49	1:1 and 0.6:1	2.6	5	80% Survival @ Year 3																		
		Open Water	7.09																							
		Trees			1:1																					
		Coast Live Oak	5	10:1	50																					
	Santa Rosa Creek Diversion Project	Waters	0.39			50 Trees	3	Provide Canopy																		
	SMP	All Habitat			1.1:1		5				1.1:1						1.1:1						1.1:1			
		All Habitat (If performance does not meet crieria)			2:1		5				2:1						2:1						2:1			
		Native Trees (>4" dbh)			2:1		5				2:1						2:1						2:1			
		Non-Native Trees (>4" dbh)			1.5:1		5				1.5:1						1.5:1						1.5:1			

Note: Colors correspond to benchmarking agencies and are used to make the document easier to view

APPENDIX F

Additional Mitigation Information

APPENDIX F: ADDITIONAL MITIGATION INFORMATION

INTRODUCTION

This appendix includes additional background information from the audits of the District's and benchmarking agencies' mitigation requirements. The benchmarking agencies were:

- Contra Costa County Department of Public Works (CCCO)
- Contra Costa County Water Agency (CCWA)
- East Bay Municipal Utility District (EBMUD)
- Marin Municipal Water District (MMWD)
- San Francisco Public Utilities Commission (SFPUC)
- Sonoma County Water Agency (SCWA)

The information in these tables was used to develop the graphics for this report. The tables in this appendix provide the following information:

- Table F-1 provides a summary of the District Stream Maintenance Program 2 (SMP2) maintenance activities, impacts, and mitigation ratios.
- Table F-2 provides a summary of the District SMP1 impacts and mitigation requirements.
- Table F-3 provides a summary of the District Watershed and Water Utilities projects impacts, mitigation ratios, and mitigation requirements.
- Table F-4 provides a summary of the SCWA SMP mitigation ratios.
- Table F-5 provides a summary of the SCWA SMP mitigation required and completed.
- Table F-6 provides a summary of the impacts, mitigation ratios, and mitigation requirements for benchmarking agency watershed and water utilities projects.

SUMMARY OF DISTRICT MITIGATION

SMP2

Table F-1: Summary of District SMP Mitigation Ratios

<table>
<tr><th rowspan="2">Maintenance Activity</th><th rowspan="2" colspan="2">Mitigation Type</th><th colspan="2">Modified Channel</th><th colspan="2">Modified Channel with Ecological Value</th><th colspan="2">Unmodified Channel</th></tr>
<tr><th colspan="2">Non-Land Based Acquisition</th><th colspan="2">Non-Land Based Acquisition</th><th colspan="2">Non-Land Based Acquisition</th></tr>
<tr><td rowspan="11">Sediment Removal</td><td colspan="2">Invasive Plant Management Program[1]</td><td colspan="2">1:1, 2:1</td><td colspan="2">1:1, 2:1</td><td colspan="2">1:1, 2:1</td></tr>
<tr><td colspan="2">Riparian Restoration and Planting Program</td><td colspan="2">1.1:1</td><td colspan="2">1.3:1</td><td colspan="2">1.5:1</td></tr>
<tr><td colspan="2">Individual Tree and Shrub Planting: Trees: <6 inches</td><td colspan="2">1.1:1</td><td colspan="2">1.3:1</td><td colspan="2">1.5:1</td></tr>
<tr><td colspan="2">Individual Tree and Shrub Planting: Trees: 6-12 inches[2]</td><td colspan="2">1:1, 2:1, 3:1</td><td colspan="2">1:1, 2:1, 3:1</td><td colspan="2">1:1, 2:1, 3:1</td></tr>
<tr><td colspan="2">Instream Complexity</td><td colspan="2">1:1</td><td colspan="2">1:1</td><td colspan="2">1:1</td></tr>
<tr><td colspan="2">Large Woody Debris Replacement</td><td colspan="2">1:1</td><td colspan="2">1:1</td><td colspan="2">1:1</td></tr>
<tr><td rowspan="5">Land Acquisition-Based Mitigation</td><td>Function</td><td>In-kind</td><td>Out-of-kind</td><td>In-kind</td><td>Out-of-kind</td><td>In-kind</td><td>Out-of-kind</td></tr>
<tr><td>Preservation</td><td>3:1</td><td>4:1</td><td>3:1</td><td>4:1</td><td>3:1</td><td>4:1</td></tr>
<tr><td>Enhancement</td><td>2:1</td><td>3:1</td><td>2:1</td><td>3:1</td><td>2:1</td><td>3:1</td></tr>
<tr><td>Restoration</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td></tr>
<tr><td>Establishment</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td><td>2:1</td></tr>
</table>

Table F-1 (Continued): Summary of District SMP Mitigation Ratios

Vegetation Management	Invasive Plant Management Program[1]		1:1, 2:1		1:1, 2:1		1:1, 2:1	
	Riparian Restoration and Planting Program		1.1:1		1.3:1		1.5:1	
	Individual Tree and Shrub Planting: Trees: <6 inches		1.1:1		1.3:1		1.5:1	
	Individual Tree and Shrub Planting: Trees: 6-12 inches[2]		1:1, 2:1, 3:1		1:1, 2:1, 3:1		1:1, 2:1, 3:1	
	Land Acquisition-Based Mitigation	**Function**	**In-kind**	**Out-of-kind**	**In-kind**	**Out-of-kind**	**In-kind**	**Out-of-kind**
		Preservation	3:1	4:1	3:1	4:1	3:1	4:1
		Enhancement	2:1	3:1	2:1	3:1	2:1	3:1
		Restoration	2:1	2:1	2:1	2:1	2:1	2:1
		Establishment	2:1	2:1	2:1	2:1	2:1	2:1
Bank Stabilization	Invasive Plant Management Program[1]		1:1, 2:1		1:1, 2:1		1:1, 2:1	
	Riparian Restoration and Planting Program		1:1, 2:1		1:1, 2:1		1:1, 2:1	
	Individual Tree and Shrub Planting: Trees: <6 inches		1.1:1		1.3:1		1.5:1	
	Individual Tree and Shrub Planting: Trees: 6-12 inches[2]		1:1, 2:1, 3:1		1:1, 2:1, 3:1		1:1, 2:1, 3:1	
	Land Acquisition-Based Mitigation	**Function**	**In-kind**	**Out-of-kind**	**In-kind**	**Out-of-kind**	**In-kind**	**Out-of-kind**
		Preservation[3]	3[4]	4	3	4	3	4
		Enhancement	2	3	2	3	2	3
		Restoration	1.5	2	1.5	2	1.5	2
		Establishment	1.5	2	1.5	2	1.5	2

[1] Ratio of 1:1 applies to Tier 1 species (invasive plant control requires two years or less time to achieve). Ratio of 2:1 applies to Tier 2 species (invasive plant control requires more than two years to achieve).

[2] Ratio depends on tree appraisal results

[3] Preservations will not be an acceptable form of mitigation for the RWQCBs

[4] Mitigation ratios for land acquisition mitigation are increased by these multipliers

Note: Land acquisition ratios will be used for planning purposes only. Ratios are subject to agency approval through the NPW review process or separate land acquisition proposal(s).

SMP1

Table F-2: Summary of District Mitigation Requirements for the SMP

Habitat	Impact	Mitigation Ratio (Mitigation: Impact)	Mitigation Commitments (acres)
Bank Planting	Case by case basis	1:1 and 3:1[1]	Case by case basis
CRLF	108	1:1	128
Giant Reed Control	66	1.9:1	125
Large Woody Debris	Not Tracked	N/A	Not Tracked
Minor Work Activities	Case by case basis	1:1	Case by case basis
Nontidal Wetland: Freshwater Wetland Creation/Restoration component	14	1:1	14
Nontidal Wetland: Stream and Watershed Protection component	92	10:1 and 15:1[2]	820 to 1,080
Smooth Cordgrass Control	30	0.33:1	10
Tidal Wetland[3]	30	1:1	30
Vegetation	Case by case basis	1:1 and 3:1[4]	Case by case basis

[1] The 1:1 ratio applies to temporary impacts and the 3:1 ratio applies to permanent impacts.

[2] The 10:1 ratio applies to lands adjacent to stream resources up to 50 feet from the centerline of first order streams and 150 feet from the centerline of second order and great streams. The 15:1 ratio applies to lands from 150 up to 500 feet from the centerline of second order and greater streams.

[3] Tidal wetland habitat also compensates for the requirement to restore Clapper Rail habitat

[4] The 1:1 ratio applies to non-native vegetation species and the 3:1 ratio applies to native vegetation species.

District Watershed and Water Utility Projects

Table F-3: Summary of Mitigation Requirements for Watershed and Water Utility Projects (acres unless specified)

Habitat	Project	Impact		Mitigation Ratio (Type of Impact in Parentheses)	Mitigation Required
		Permanent	Temporary		
Riparian	Adobe Creek Watershed: Foothill Expressway	0.66	No Impact	1:1 (Permanent)[1]	0.66
	Adobe Creek Watershed: Upper Reach 5	0.52	0.06	1:1 (Permanent) 4:1 (Temporary)	0.76
	Calabazas Creek Flood Project	0.02	0.15	1:1 (Permanent) 3:1 (Temporary)	0.21
	Guadalupe river project (Downtown)	13.77	No Impact	1.5:1 (Permanent)	21
	Lower Coyote Creek Flood Control Project Reach 2	12	No Impact	2.4:1 (Permanent)	12.7
	Lower Coyote Creek Flood Control Project Reach 3	13.77	No Impact	1.5:1 (Permanent)	20.5
	Lower Guadalupe River Flood Protection Project	2.16	No Impact	3:1 (Permanent)[2]	6.48
	Lower Silver Creek Flood Protection and Creek Restoration Project	0	No Impact	N/A[3]	5
	Matadero Barron Creek Long Term Remediation Project	0.66	0.48	1:1 (Temporary) 3:1 (Permanent)	2.46
	Upper Guadalupe River Flood Control Project	10.45	No Impact	2:1 (Permanent)	20.89
	Guadalupe Creek Restoration Project	N/A	No Impact	N/A	6
	Jacques Gulch Restoration Project	No Impact	0.44	1:1 (Temporary)	0.44
	Calabazas Creek Flood Project	0.03	.08	1:1 (Temporary) 3:1(Permanent)	0.17
	Almaden Reservoir/ Dam Maintenance	0.05	No Impact	3:1 (Permanent)	0.15
	Anderson Dam/ Dam Maintenance	0.2	No Impact	3:1 (Permanent)	0.6
	Stevens Creek Reservoir/ Dam Maintenance	0.1	No Impact	1:1 (Permanent, Low Quality Habitat)	0.1
	Uvas Dam and Chesbro Dam/ Dam Maintenance	0.01	No Impact	3:1 (Permanent)	0.03

Table F-3 (*Continued*): Summary of Mitigation Requirements for Capital and Water Utility Projects (acres unless specified)

Habitat	Project	Impact		Mitigation Ratio (Type of Impact in Parentheses)	Mitigation Required
		Permanent	Temporary		
Riparian/ upland/ wetland/waters mix	Reconstruction of Bollinger Bridge over Calabazas Creek	0.24	No Impact	1:1 (Permanent)	0.24
	Lenihan Dam Outlet Modification	0.09	N/A	N/A	0.09
Shaded Riverine Aquatic Cover	Guadalupe river project (Downtown)	8,315 linear feet	No Impact	2.2:1 (Permanent)	23,863 linear feet
	Upper Guadalupe River Flood Control Project	4,866 linear feet	No Impact	1:1 (Permanent)	4,866 linear feet
	Guadalupe Creek Restoration Project	N/A	N/A	N/A	13,000 linear feet
Trees	Calabazas Creek Flood Project	27 trees	No Impact	Non-native trees - 2:1 Native trees - 3:1	74
	Reconstruction of Bollinger Bridge over Calabazas Creek	3 trees	No Impact	Native trees - 3:1	9
	Lenihan Dam Outlet Modification	18 trees	No Impact	1:1[4] 3:1 Oak trees -10:1	44
Wetland	Calabazas Creek Flood Project	0.03	0.08	1:1 (Temporary) 3:1(Permanent)	0.17
	Jacques Gulch Restoration Project	0.25	No Impact	2:1 (Permanent)	0.5
	Lower Silver Creek Flood Protection and Creek Restoration Project	8.8	No Impact	1.4:1 (Permanent)	12.7
	Matadero Barron Creek Long Term Remediation Project	0.01	0.05	1:1 (Temporary) 2:1 (Permanent)	0.07
	Upper Guadalupe River Flood Control Project	1.47	No Impact	1:1 (Permanent)	1.47
	Vasona Reservoir/ Dam Maintenance	0.12	No impact	1:1 (Permanent, Low Quality Habitat)	0.12
Tidal Wetland	Lower Guadalupe River Flood Protection Project	4.74	26.06	1:1 (Temporary) 2:1 (Permanent)	35.54
Spawning Gravels	Spawning Gravels Guadalupe River Project (Downtown)	0.45	No Impact	1.3:1 (Permanent)	0.58
Non-tidal Marsh	Adobe Creek Watershed: Upper Reach 5	0.05	No Impact	1:1 (Permanent)	0.05
Upland	Lower Silver Creek Flood	2	No Impact	1:1 (Permanent)[5]	6

Table F-3 (*Continued*): Summary of Mitigation Requirements for Capital and Water Utility Projects (acres unless specified)

Habitat	Project	Impact		Mitigation Ratio	Mitigation
River Bank	Upper Guadalupe River Project	1,720 linear feet	No Impact	1:1 (Permanent)	1,720 linear feet
Marsh	Lower Coyote Creek Flood Control Project Reach 1	62 acres	No Impact	1.4:1 (Permanent)	87

N/A: Not applicable because the information was not available in the permit

[1] The 1:1 ratio applies to riparian habitat of low quality

[2] This mitigation ratio was agreed upon in consultation with CDFG. The District initially developed a methodology to mitigate areas of low quality habitat at a 1:1 ratio and areas of moderate-quality habitat at a 2:1 ratio.

[3] Even though there was no impact, there was mitigation due to a required enhancement feature.

[4] Eucalyptus and Fremont's Cottonwood are mitigated at a1:1 ratio. Arroyo willow, Big leaf Maple, California Bay, and Elderberry are mitigated at a 3:1 ratio. Oak trees are mitigated at a 10:1 ratio.

[5] Impacts are mitigated at a 1:1 ratio and an additional 4 acres are required for landscape features.

SUMMARY OF BENCHMARKING AGENCIES' MITIGATION

SCWA SMP

Mitigation Ratios

Table F-4: Summary of SCWA SMP Mitigation Ratios

SMP Activity	Mitigation Ratio
All activities in all habitats	1.1:1
All activities in all habitats (If the mitigation does not meet performance criteria)	2:1
Native trees (>4 inches diameter at breast height)	2:1
Non-native trees (<4 inches diameter at breast height)	1.5:1

Total Mitigation

Table F-5: Summary of SCWA SMP Mitigation

Year	Impact	Mitigation Required			Mitigation Acquired			Tier 3 Cost
		Tier 1 Mitigation Requirements (acres)	Tier 2/3 Mitigation Requirement (acres)	Total Required (acres)	Tier 1 Mitigation Obtained (acres)	Tier 2/3 Mitigation Obtained (acres)	Tier 3 Mitigation Banked (acres)	
2009	1.51	1.51	0.67	2.18	1.51	1.83	1.16	$71,978
2010	6.47	6.47	1.28	7.75	6.47	1.54	1.42	$78,154
2011	7.5	7.08	0.94	8.02	7.08	5.21	4.27	$199,584
2012[1]	9.71	9.15	1.56	10.71	9.15	11.12	9.15	$97,255
2013[2]	7.64	7.11	1.28	8.39	7.11	1	0.31	$93,888
Total	32.83	31.32	5.73	37.05	31.32	20.7	16.31	$540,859

[1] Note: 0.55 acres of impacts were previously mitigated

[2] Note: 0.67 acres of impacts were previously mitigated

Benchmarking Watershed Management and Water Utiltiies Projects

Table F-6: Summary of Mitigation for Benchmarking Agencies (acres unless specified)

Habitat	Benchmarking Agency	Project	Impact		Mitigation Ratio		Mitigation Required
			Permanent	Temporary			
Riparian	CCCO	Norris Canyon Estate San Catanio Creek Tributary Stabilization Project	No Impact in permit[1]	No Impact in permit	1:1		No mitigation detailed in permit
	CCCO	The Fernandez Ranch Public Access and Creek Restoration Project	No Impact	0.35	0.9:1		0.32
	SFPUC	San Antonio Backup Pipeline	0.03	0.45	RWQCB	1:1 and 4.3:1[2]	0.58
					CDFW	0.3:1	0.14 acres and 21 linear feet
	SFPUC	Calaveras Dam Replacement Project	2.24	0.34	1.1:1[3] 3:1		7.09
	SCWA	Matanzas Creek Detention Reservoir Sediment Removal Project	1.7	1.49	1:1[4] 0.6:1		2.6
Waters	CCCO	Norris Canyon Estate San Catanio Creek Tributary Stabilization Project	652 linear feet	No Impact	0.84:1		550 linear feet
	CCWA	Alternative Intake Project	0.7	No Impact	3:1		2.1
	MMWD	Devil's Gulch Water Quality Improvement Project	No Impact	0.016	1:1		0.016
	SFPUC	Pipeline Seismic Upgrade Project	0.02	No Impact	1:1		0.02
	SFPUC	Calaveras Dam Replacement Project	0.55	0.1	1.1:1[3] 3:1		1.76

Table F-6 (*Continued*): Summary of Mitigation for Benchmarking Agencies (acres unless specified)

Habitat	Benchmarking Agency	Project	Impact		Mitigation Ratio	Mitigation Required
			Permanent	Temporary		
Trees	CCCO	Norris Canyon Estate San Catanio Creek Tributary Stabilization Project	85	No Impact	3:1[5]	255
	CCWA	Los Vaqueros Reservoir Expansion Project	No Impact in permit	No Impact in permit	3:1[5]	No mitigation detailed in permit
	MMWD	Phoenix Lake Road Pipeline Seismic Reliability Project	No Impact in permit	No Impact in permit	3:1[5]	No mitigation detailed in permit
	SCWA	Matanzas Creek Detention Reservoir Sediment Removal Project	No Impact in permit	No Impact in permit	1:1 and 10:1[6]	No mitigation detailed in permit
Wetland	CCCO	The Fernandez Ranch Public Access and Creek Restoration Project	0.092	No Impact	2:1	1.184
	CCWA	Los Vaqueros Reservoir Expansion Project	No Impact in permit	No Impact in permit	No mitigation ratio in permit	20.01
	SCWA	Matanzas Creek Detention Reservoir Sediment Removal Project	No impact	0.55[3]	1.56:1	0.86
	SFPUC	Calaveras Dam Replacement Project	0.7	0.06	1.1:1[3] 3:1	2.76
Upland	SFPUC	San Antonio Backup Pipeline	0.82	18.42	No mitigation ratio in permit	14.5
Vegetation	CCWA	Los Vaqueros Reservoir Expansion Project	No Impact in permit	No Impact in permit	1:1[7]	No mitigation detailed in permit

Table F-6 (*Continued*): Summary of Mitigation for Benchmarking Agencies (acres unless specified)

Habitat	Benchmarking Agency	Project	Impact			Mitigation Ratio	Mitigation Required
			Permanent		Temporary		
Land-Acquisition Mitigation	EBMUD	San Pablo Dam Seismic Upgrade Project	2		0.62	14:1	37
	SFPUC	Calaveras Dam[8] Replacement Project	SFRW QCB	16.57 and 4,603 linear feet	20.29 and 6,215 linear feet	3:1	112 acres 60,160 linear feet
			USFWS	300 acres	350 acres	1.8:1	1151.49 acres
			CDFW	7.64 4,593 linear feet	18.69 1,281 linear feet	1.1:1[3] 3:1	11.94 acres 13,779 linear feet

[1] The phrase "no impact in permit" refers to permits that established mitigation ratios but did not clarify the required mitigation area.

[2] The 1:1 ratio is for temporary impacts and the 4.3:1 ratio is for permanent impacts. There were two different requirements established by RWQCB and CDFW.

[3] The 1.1:1 ratio applies to temporary impacts and the 3:1 ratio applies to permanent impacts.

[4] The 1:1 ratio applies to temporary impacts to riparian habitat and the 0.6:1 ratio applies to permanent impacts to riparian habitat

[5] The 3:1 ratio applies to native trees

[6] The 1:1 ratio applies to non-native trees. The 10:1 mitigation ratio applies to Coast Live oak tree species

[7] Mitigation ratio for temporary impacts

[8] Mitigation was different between the three regulatory agencies. The USFWS mitigation ratio was calculated using the impact from the SFRWQCB permit.

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APPENDIX G

Interview Forms

PANORAMA
ENVIRONMENTAL, INC.

Santa Clara Valley
Water District

Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review

STAFF INTERVIEW QUESTIONNAIRE

INTRODUCTION

The District is responsible for providing safe, clean water for a healthy life, environment, and economy for Silicon Valley and all the communities we serve. To fulfill that mandate, the District must comply with regulatory requirements from several state and federal resource agencies, including establishing and maintaining compensatory mitigation for environmental impacts from projects and programs.

Towards that end, Panorama Environmental, Inc. (as a consultant to the District) is performing an independent Mitigation and Monitoring Compliance Audit and Benchmarking Review to evaluate whether the District is meeting applicable legal and regulatory requirements related to its mitigation obligations, and to benchmark against other public agencies. The audit will focus on the District's operations and maintenance activities, and capital projects in both the watershed and water utility divisions, including all mitigation associated with the District's multi-year Stream Maintenance Program (SMP). The SMP was developed in 2001 to provide multi-year regulatory permits for conducting annual routine stream and canal maintenance on District property and easements. Activities include sediment removal, vegetation management, stream bank stabilization, and minor maintenance activities such as fence repair and graffiti removal.

Panorama is conducting interviews with knowledgeable district personnel to supplement review of existing information. Please contact Laurie Hietter at (650) 340-4822 or laurie.hietter@panoramaenv.com or Kristen O'Kane at (408) 630-2692 or kokane@valleywater.org if you have any questions about completing the questionnaire.

STAFF INTERVIEW QUESTIONNAIRE

Name: Click here to enter text.

Title/Role: Click here to enter text.

Department/Division: Click here to enter text.

Date: Click here to enter text.

1) Describe your role in, and the process for, defining, acquisition, tracking, reporting the District's compensatory mitigation:

Click here to enter text.

2) Describe the process for determining compensatory mitigation and ratios during the environmental review and permitting process. Who defines the mitigation (District, consultant, agency)? Describe the negotiation process with the agencies.

Click here to enter text.

3) What are the factors that lead to the final compensation ratios (agency, consultant, project manager schedule, other)?

4) What actions has the District taken to comply with compensatory mitigation requirements? Describe your observations.
Click here to enter text.
5) Which actions were effective in achieving the compensatory mitigation requirements?
Click here to enter text.
6) Were any actions ineffective in achieving the mitigation requirements?
Click here to enter text.
7) How are compliance issues tracked?

8) Are there any gaps that you have noticed in the tracking, reporting, or acquisition compliance process?
Click here to enter text.
a) Were these gaps reported and were there any additional actions taken when you became aware of these gaps?
Click here to enter text.
b) Were these additional actions effective?
Click here to enter text.
c) How are issues tracked by management?
Click here to enter text.
9) Do you have any future recommendations for closing any compliance gaps?
Click here to enter text.

10) Is there anything else you think we should know about the District's compensatory mitigation program? What other questions should we be asking?
Click here to enter text.

PANORAMA
ENVIRONMENTAL, INC.

CONFIDENTIAL

Santa Clara Valley Water District

Compensatory Mitigation and Monitoring Compliance Audit and Benchmarking Review

BENCHMARKING INTERVIEW QUESTIONNAIRE

INTRODUCTION

The Santa Clara Valley Water District (District) is responsible for providing safe, clean water for a healthy life, environment, and economy for Silicon Valley and all the communities they serve. To fulfill that mandate, the District must comply with regulatory requirements from several state and federal resource agencies, including establishing and maintaining compensatory mitigation for environmental impacts from projects and programs. Compensatory mitigation includes acquiring mitigation lands (such as through mitigation banks) and restoring habitats on existing or new lands.

Panorama Environmental, Inc. (as a consultant to the District) is performing an independent Mitigation and Monitoring Compliance Audit and Benchmarking Review to evaluate whether the District is meeting applicable legal and regulatory requirements related to its mitigation obligations, and to benchmark their requirements against other public agencies addressing similar species and habitat impacts.

Panorama is conducting interviews with knowledgeable agency personnel to supplement review of readily available information and to provide the District with an understanding and comparison of the compensatory mitigation requirements of other California agencies. Your participation in this effort will help the District in their endeavors to understand and improve permitting consistency and efficiency across the region.

Our team would greatly appreciate if you could complete the attached questionnaire to help aid in this data gathering. If you prefer, we can take your responses in a telephone interview. The responses will remain confidential for internal use at the District. The information obtained will not be attributed to you or your organization. As a participant, you will receive a summary of the results of the survey.

Please contact Laurie Hietter at (650) 340-4822 or laurie.hietter@panoramaenv.com or Kristen O'Kane at (408) 630-2692 or kokane@valleywater.org if you have any questions about completing the questionnaire.

AGENCY BENCHMARKING INTERVIEW QUESTIONNAIRE

Name: Click here to enter text.	
Title/Role: Click here to enter text.	
Department/Division: Click here to enter text.	
Date: Click here to enter text.	

1) What types of projects have required compensatory mitigation (e.g., pipeline maintenance projects, dam retrofits, new facilities, habitat enhancement projects)?
Click here to enter text.
2) Describe the process for determining compensatory mitigation (i.e., compensation for effects to wetlands and endangered species habitats) for your projects.
Click here to enter text.
3) For what species and habitats has compensatory mitigation been required?
Click here to enter text.

4) What are the factors that determine compensation ratios, such as 3:1 mitigation for loss of habitat? Are they internal or external?

Click here to enter text.

5) Who negotiates with the regulatory agencies for compensatory mitigation (e.g., internal staff biologists, internal staff planners, consultants)?

Click here to enter text.

6) Which agencies have required compensatory mitigation?

Click here to enter text.

7) What types of compensatory mitigation have you implemented , for what species and/or habitats (e.g., wetland, upland, saltwater marsh) and what are the ratios? Do the ratios vary by project and if so, can you identify the range of ratios that you have had to implement by species and/or habitat?

Click here to enter text.

8) What have been the terms for monitoring for mitigation success (i.e., how many years, how frequent is monitoring, how long do you have to establish the mitigation)?

Click here to enter text.

9) What type of compensatory mitigation compliance has been most difficult to implement and why (e.g., California red-legged frog habitat because finding suitable land is difficult)?

Click here to enter text.

10) Have you been able to renegotiate permit terms and compensatory mitigation commitments? If so, what was the process that you used with the agency?

Click here to enter text.

11) Do you track your mitigation compliance? How do you track it (e.g., such as through a GIS database)?

Click here to enter text.

12) Is there anything else you think we should know about your agency's compensatory mitigation program?
Click here to enter text.